Progressive Architecture

November 1984

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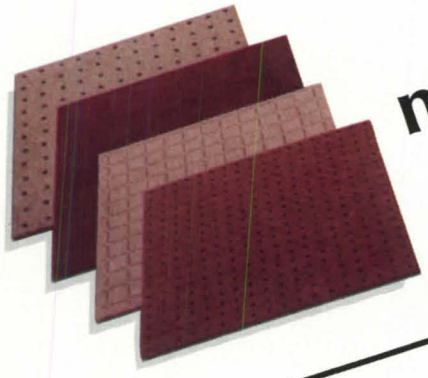
Emilio Ambasz & Associates, Inc., architects. Bank Brussels Lambert, New York. Paul Warchol photography. Carpet tile design by Emilio Ambasz ©1984. All rights reserved by the designer.

Progressions: patterns in modular carpet by Lees



Emilio Ambasz applied interior architecture to create a striking visual design for Bank Brussels Lambert. The carpet tile designed by Ambasz sets strong linear forms against a gunmetal ground. This modular carpet system by Lees offers the optimum combination of aesthetics, comfort and performance.

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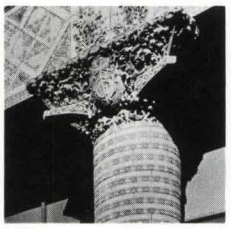
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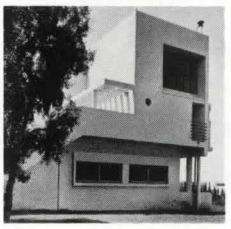
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Cover
A recently cleaned, 18th-Century restoration of a detail of the Arch of Constantine, Rome (p. 110). Photography: Barbara Bini.

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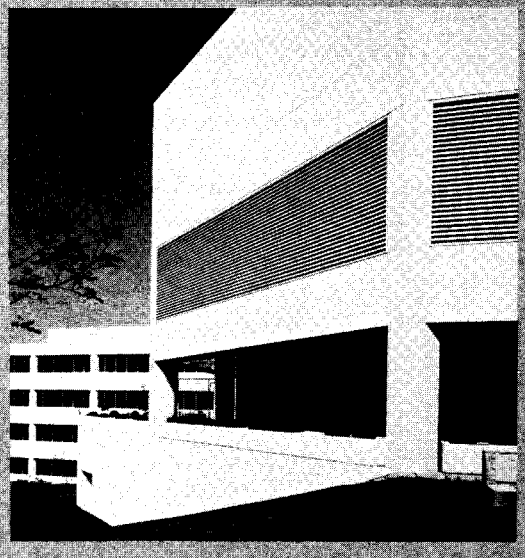

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Grasping our heritage

Few of us would claim that this is the best of architectural worlds. We surely have the most advanced technology to date, and the greatest outpouring of printed information, but we don't seem to be designing the best buildings of all time, getting the most public respect, or commanding the fairest share of our society's wealth.

One area in which we rate a superlative is in our appreciation for architecture of all kinds, from all times and places. Throughout most of history, everyone's view of architecture was necessarily parochial. By the 18th Century, architects and patrons in Europe could take a lively interest in the archaic, the rustic, and the geographically exotic, but that did not shake their belief in the superiority of their established monumental styles. Then, out of the intellectual turmoil of the 19th Century came Modernism, with its reversed biases: Official European architecture was thought to have gone wrong centuries before; hope was placed in the forms found in primitive and utilitarian structures, and in newly conceived abstract visions. Although the Modern theorists venerated grain elevators and trainsheds, they hardly considered them as objects of preservation; all structures were to be abandoned when no longer useful—or demolished even sooner to make way for the newer and better. Preservation was the dubious concern of Modernism's opponents—antiquarians, demagogues, and guilt-ridden millionaires.

Today, liberated from various past biases, we can address our informed admiration to the Taj Mahal or to an exemplary miniature golf course. We are acutely aware of the transience of everything built on earth, and reasons can be advanced for saving just about all of it. Though only a minority of our society cares about preserving architecture, our ability to sway the public has been well proven. Now we have an enormous array of difficult choices to make in using that power.

With a fuller appreciation for the whole range of architecture than any people of the past, we necessarily face the most difficult preservation decisions.

The amount of our built environment deemed worthy of preservation has outstripped the resources that can reasonably be devoted to the effort. We must make new contributions of our own, as well, and they cannot be obstructed by every Victorian fire station or Art Deco cafeteria.

What, then, must we save? There is little question about structures that are exceptional by worldwide standards, such as the works featured in this issue. In many cases, it is equally essential to save what is common but characteristic—the blockfronts of Paris, for instance, or its kiosks. Somewhat more debatable are structures that are exceptional, but only locally, such as the surviving wood houses in Manhattan. Some structures are in ways both typical and exceptional: There are hundreds of white wood churches in New England, for instance, and they are preserved both as characteristic regionally and as exceptional in their localities. On the other hand, the Victorian stone churches that sometimes replaced the usual type are likely to be underrated; so, too, the 20th-Century imitations of white New England churches found in distant states—which may, after all, be very well designed. To preserve intelligently, we must cut through a lot of preconceptions.

There are many other issues: What are we preserving structures from? It isn't always demolition. Insensitive alteration is in some ways a more pervasive threat—to unappreciated buildings—because it goes on with little public attention. Such thoughtless alteration, perpetrated before today's landmarks were rediscovered, is what much of our preservation work must undo.

Is it always wise to save a building by finding a new use? This adaptive reuse strategy seemed a perfect answer a few short years ago—and sometimes it is. Turning old warehouses into housing or shopping malls can save money and other resources—and preserve valuable parts of the urban fabric, at least visually. But we must retain a healthy skepticism about whether adaptive reuse accommodates its new uses appropriately, and whether the partial preservation it involves is worth the public support that it often requires. Carving a church up into luxury apartments is a pretty desperate, symbolically disturbing way to save a valued building shell.

In the end, nothing beats preserving the uses along with the buildings. We cannot, of course, save uses that are economically or socially obsolete (sweatshop industries in our urban lofts or millionaires in our marble mansions). We can, however, try hard to keep urban functions in our cities and working farms around our farmhouses. It is to the larger issues of how our society's resources are used and distributed that we must give some serious attention, if we are to keep the best of the world's architecture as a setting for real life. ■

John Morris Dixon


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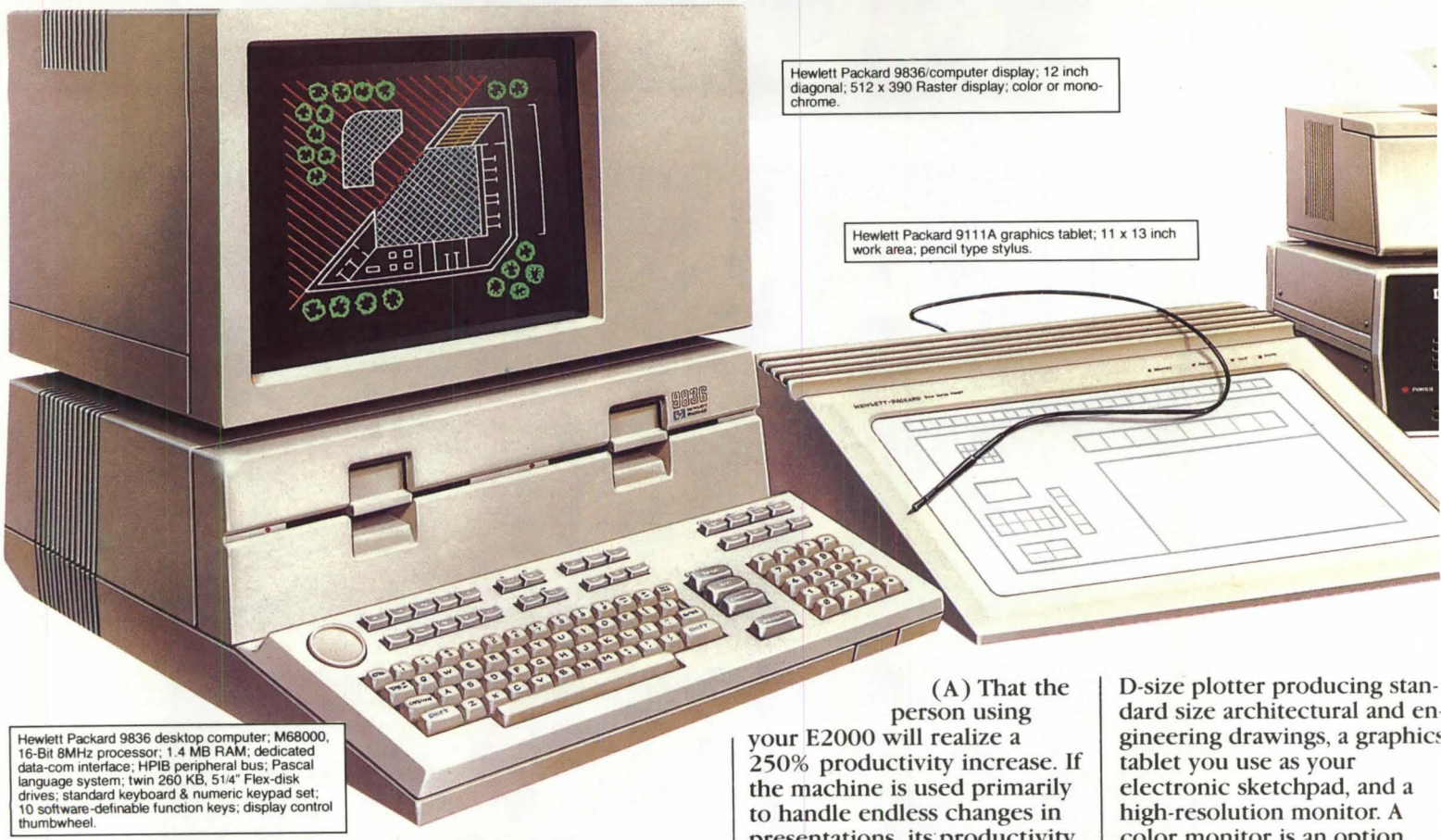

Hewlett Packard 9836/computer display; 12 inch diagonal; 512 x 390 Raster display; color or monochrome.

Hewlett Packard 9111A graphics tablet; 11 x 13 inch work area; pencil type stylus.

Hewlett Packard 9836 desktop computer; M68000, 16-Bit 8MHz processor; 1.4 MB RAM; dedicated data-com interface; HPIB peripheral bus; Pascal language system; twin 260 KB, 5¼" Flex-disk drives; standard keyboard & numeric keypad set; 10 software-definable function keys; display control thumbwheel.

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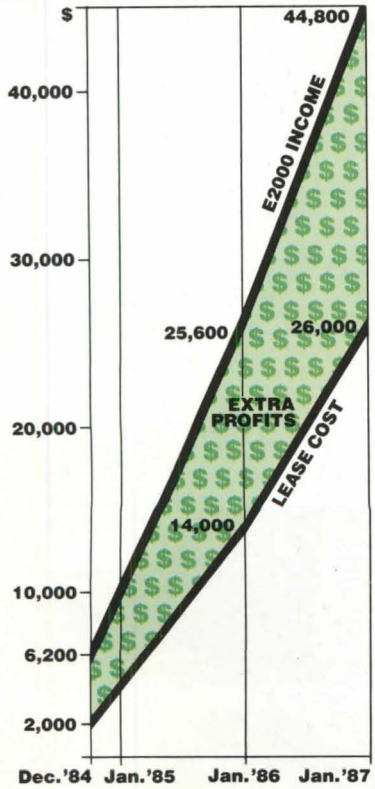
CASHMACHINE.



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THE PRODUCT.

E2000 is a hardware/software system for computer-aided design developed by Carrier and introduced in January 1983. It is offered to design professionals for sale or lease, with the software available under an annually renewable license. Its programs are menu-driven in that they prompt the operator at regular intervals, making it among the easiest CAD systems to use. E2000 comes complete with a library of architectural details and symbols, saving you weeks of "shopping" time. You can be using the system productively after only two days of training. E2000 consists of Hewlett Packard's latest model desktop computer, a 15-megabyte hard disk drive for symbol and drawing storage, two 5¼" floppy disk drives for drawing entry and retrieval, a full D-size plotter producing standard size architectural and engineering drawings, a graphics tablet you use as your electronic sketchpad, and a high-resolution monitor. A color monitor is an option. E2000 is also available with an E-size plotter and may be expanded to as many as 64 workstations via a shared-resource manager package. To otherwise get the increase in productivity and storage capability that E2000 offers, you'd need to more than double your drafting department, probably moving to larger quarters. Even that wouldn't bring the same enhancement to your professional reputation that will come with using E2000.

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With E2000 you produce precise, crisp pen-and-ink drawings, even in colors, in the time it now takes to complete a pencil drawing. It maintains complete systems drawings on inexpensive, mailable floppy disks. It converts drawings instantly from one scale—including English and SI/Metric—to any other. It facilitates lightning-fast corrections and immediately provides perfect new drawings. You create and store a drawing, of a piping diagram for example, and never have to render it again. With the color model, you plot mechanical, electrical and architectural systems each in its own colors. Combine smaller drawings to produce a large, final drawing. Display a drawing from as many as 250 levels. You can even send

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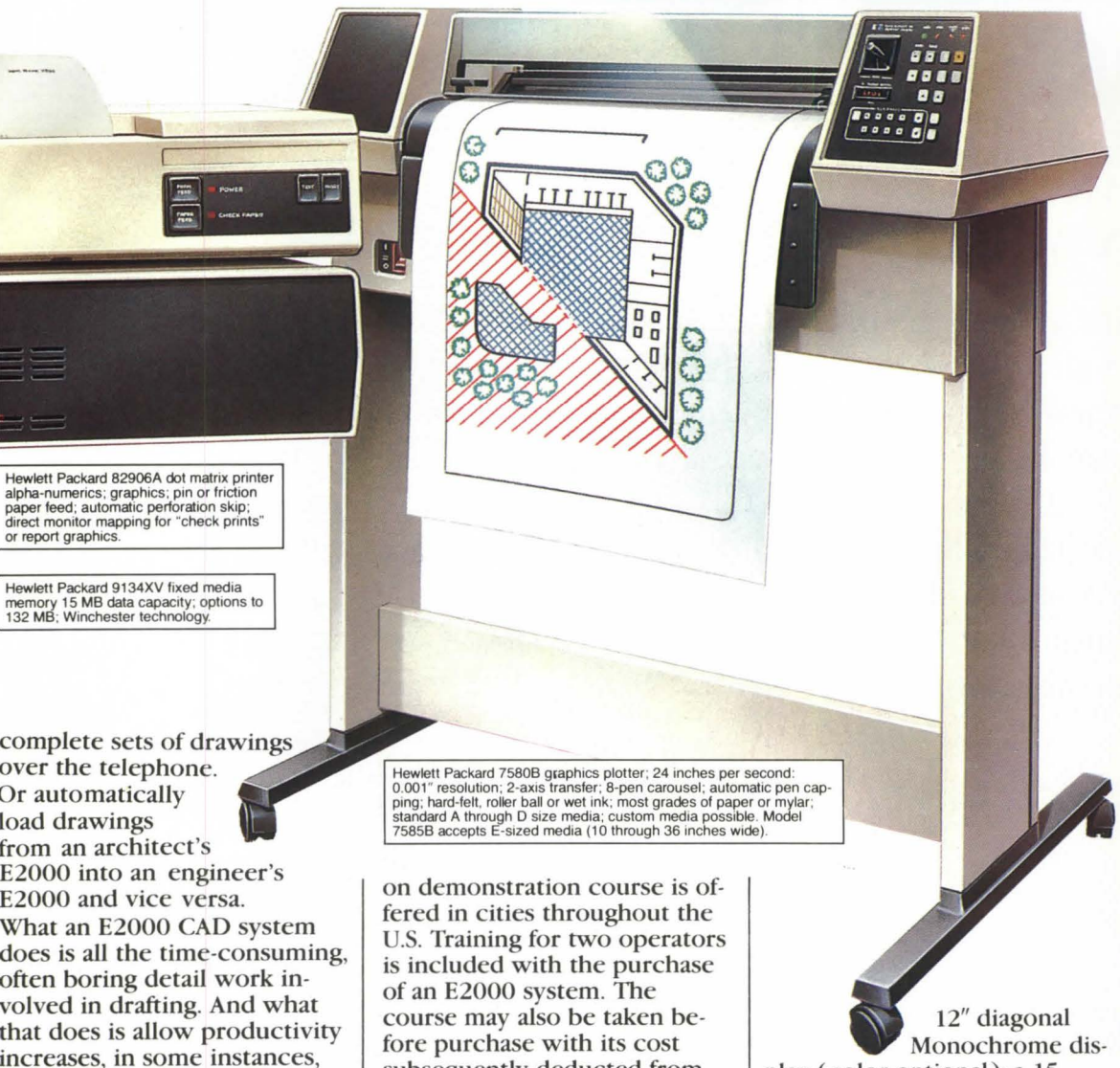

Hewlett Packard 82906A dot matrix printer alpha-numerics; graphics; pin or friction paper feed; automatic perforation skip; direct monitor mapping for "check prints" or report graphics.

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complete sets of drawings over the telephone. Or automatically load drawings from an architect's E2000 into an engineer's E2000 and vice versa. What an E2000 CAD system does is all the time-consuming, often boring detail work involved in drafting. And what that does is allow productivity increases, in some instances, of as much as 1000%.

THE YIELD.

Here's a breakdown of potential E2000 productivity expectations:

1/1 On total new object creation.
10/1 On lettering and dimensions.
100/1 On "stored" object use.
1000/1 On changes and/or "as built" renderings.

THE COST.

The purchase price of a single-workstation E2000 (with D-sized plotter) including the first-year software license fee is under $38,000. Color display systems start at $40,000. A small annual software license renewal fee thereafter includes all updates, and software support. The system can also be leased. A 5-year hardware and software lease is currently offered for under $1000 per month.

THE TRAINING.

You can use your E2000 CAD —productively—after only two days of training. A hands-on demonstration course is offered in cities throughout the U.S. Training for two operators is included with the purchase of an E2000 system. The course may also be taken before purchase with its cost subsequently deducted from the first year's license fee.

THE LIBRARY.

This is what sets E2000 apart from all other CAD systems. And makes it so applicable to the construction industry. A partial list of the library's "catalog" includes details and symbols for architectural, mechanical, electrical, piping, sprinkler, lighting and ductwork systems. The library also includes HVAC specialty details and symbols, control and starter details and symbols, and multiple-view HVAC equipment drawings. And, with Carrier's ongoing support, the library will continue to grow in response to user needs.

THE HARDWARE.

Hardware for the E2000 is made by Hewlett Packard, a company with 40 years experience and a reputation for excellence the equal of Carrier's. E2000 components represent the latest technology, yet come with proven track records. The heart of the system is the fast, compact, twin disk, desktop computer. There's a 12" diagonal Monochrome display (color optional); a 15 megabyte hard disk; a full size plotter with 8-pen carousel and a speed of 24 inches per second; and a graphics tablet with electronic pencil as an alternative to the keyboard.

THE SERVICE.

The software license fee includes all updates and improvements in software and software support. Beyond the first year, support is included in the small annual renewal fee.

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- Friendly. E2000 speaks design professional's English.
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- Expandable. Up to 64 stations with no loss of C.P.U. speed.
- Growing. Additions based on user feedback.
- Supported. Updating and telephone consultations included in license.
- Complete. Architectural and engineering library with wealth of predrawn details.

THE COMPETITION.

NONE in comparable library content. **NONE** in system comprehension. **NONE** in price.

THE PRICELESS INGREDIENT.

E2000 is unique in its low cost and in its library offering. The menu-driven program approach is simple—regularly prompting the user in the familiar language of the design shop. The move to productivity is fast—a two-day training period. There's strong software support in the form of telephone consultations. And the hardware is backed by Hewlett Packard's nationwide service organization. E2000 bears all the hallmarks of a Carrier product—from conception to service. And the overriding characteristic is quality.

THE NEXT STEP.

There's not much time left in 1984. Talk to your accountant this week. Then get on the phone to the nearest E2000 CAD center listed below.

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E2000 is sold, installed and serviced out of regional Carrier CAD Centers in these cities:

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For more in-depth literature, call 1-800-HANDS-ON. For answers on specific hardware and software, contact your nearest regional E2000 CAD Center.
For information about E2000 training, call (404) 252-8885, or write: **Carrier Corporation, Marketing Systems Development, P.O. Box 4808, Syracuse, N.Y. 13221.**

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IBM ON TELECOMMUNICATIONS

Q. CAN A CABLING SYSTEM UNTANGLE TELECOMMUNICATIONS?

A. With all the various devices a company uses to process, move and store information, it's easy to lose sight of one important element—the need to connect all these devices together. That's where a uniform, structured cabling system fits in. But are you just substituting one set of wires for another? Here are some questions and answers that might help you better understand the role a cabling system can play both in solving your communications problems today and in protecting your telecommunications investment for tomorrow.

Q. First of all, just what is a cabling system?

A. A cabling system is designed on a "wire-once" concept. Just as electrical wires are run in buildings today, a cabling system is a permanently installed set of wires that connects the computers, terminals, workstations, telephones and PBXs within a large office building or a campus. This cabling system should also be the foundation for local area networks of the future.

Q. Aren't my computers and telephones already hooked up to a cabling system?

A. It's not so much a cabling system as it is a bunch of cables. Look above the drop ceilings in most office buildings, and you'll discover miles and miles of all kinds of cable. And much of it, strangely enough, is unused. The reason for this waste is that few devices (i.e., telephone, terminal, personal computer, etc.) use the same type of cable. Consequently, when a new device is installed or when one is moved from one office to another, it's quicker, easier and cheaper to run a new cable than it is to remove and reroute the old cable.

This is not to suggest, however, that running a new cable is quick, easy or inexpensive. Relocating just one terminal can cost as much as $1,500. Not to mention a week or two of downtime while the wiring gets done. And when you think about how often office workers move from one workplace to another, you can see that we're talking about a considerable expense.

Q. How can a cabling system help solve my wiring problem?

A. Once installed, a cabling system can make wiring fo a new or relocated terminal as easy as moving a plu from one socket to another. The IBM Cabling Syste calls for the one-time installation of a single cable running from each workplace, inside the walls, and into a central "wiring closet." In the office, that cable terminates in a standard faceplate on the wall not unlike an electrical outlet. In the wiring closet, the cable terminates in a patch panel that can connect it to any number of devices.

The installation of the IBM Cabling System should be considered if you're adding a number of new workstations, installing a PBX, doing a major renovation or building a new office building. In ma cases the "wire-once" benefit will cost-justify the IBM Cabling System in five years.

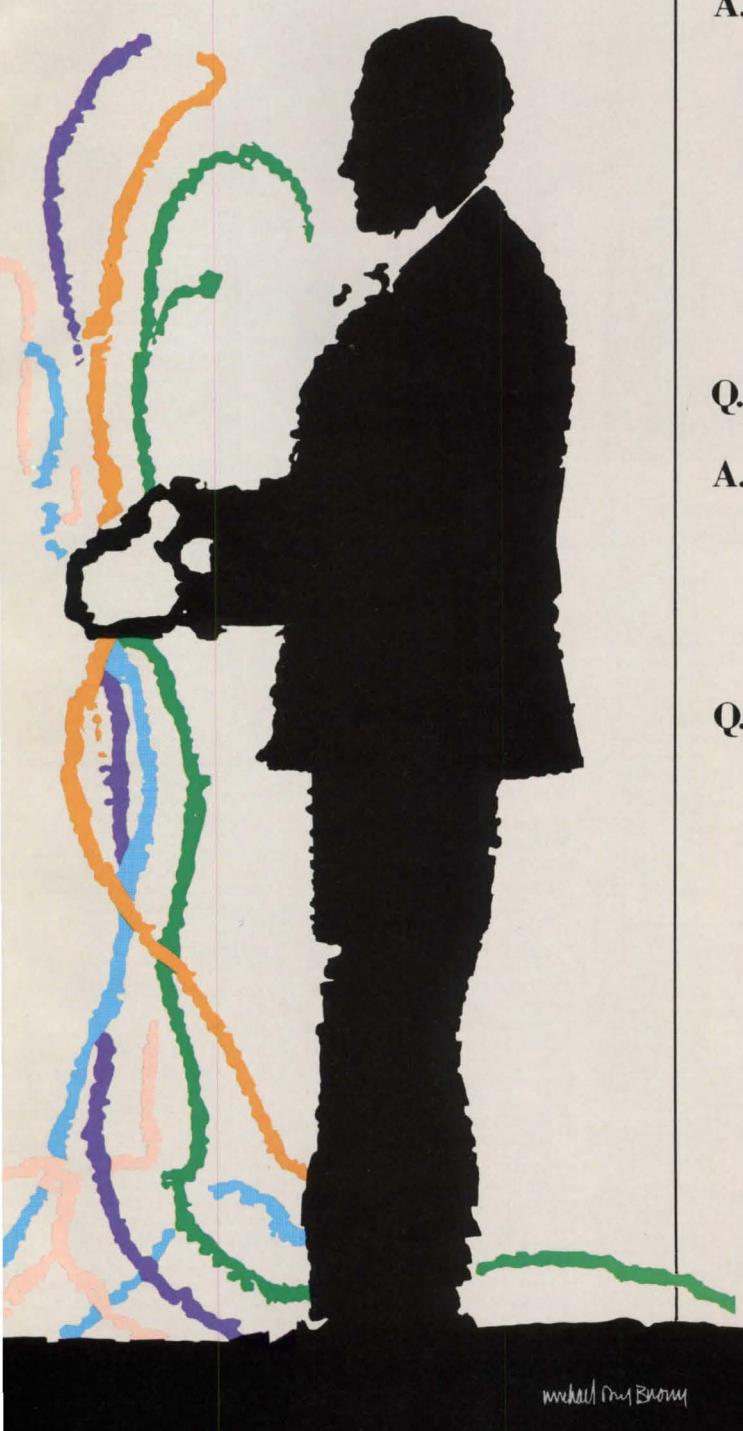
Q. How do the telephone and the IBM Cabling System work together?

A. The IBM Cabling System can be used for data only, or for both data and voice. When the voice capabilit is used, the voice wires are separated from the singl cable in the wiring closet and run to a telephone switching system. Several major PBX manufacturer have tested their PBXs and telephones with the IBM

Cabling System. They report that the voice wires fully support their PBX features and transmission speeds.

How can the IBM Cabling System help me today?

Currently being installed in office buildings, the IBM Cabling System can connect most of the available IBM data devices, such as personal computers and workstations, small and intermediate computers. We expect that it will also connect many devices made by other manufacturers.



Q. How will the Cabling System help answer my telecommunications needs of the future?

A. The quality and reliability of the IBM Cabling System enable it to transmit data at very high speeds. This makes it the ideal foundation for IBM's planned general purpose local area network (LAN). This LAN, utilizing a "token-ring" technology, can be implemented gradually to connect different workstations, departmental systems and large processors. So by investing in the IBM Cabling System today, you'll not only save money on current installation and rewiring costs, you'll also be better prepared to meet your telecommunications needs of the future.

Q. How do I go about getting the IBM Cabling System?

A. There are a number of design and installation companies that can plan your cabling system and do the actual wiring. The cable and accessories are available through authorized distributors. Your IBM marketing representative can provide you with the names of these companies. The cable and accessories can also be ordered directly from IBM.

Q. Where do I go from here?

Installing the IBM Cabling System today is really installing the foundation for your company's future in telecommunications. So you'll want to plan quite thoughtfully. We can help. If you'd like a free copy of the brochure, "The IBM Cabling System," call 1 800 IBM-2468, Ext. 594, or return the coupon.

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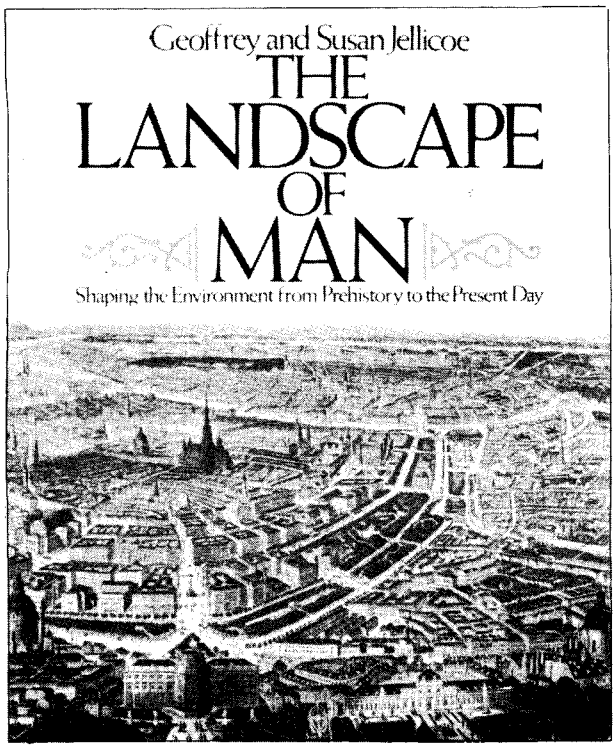

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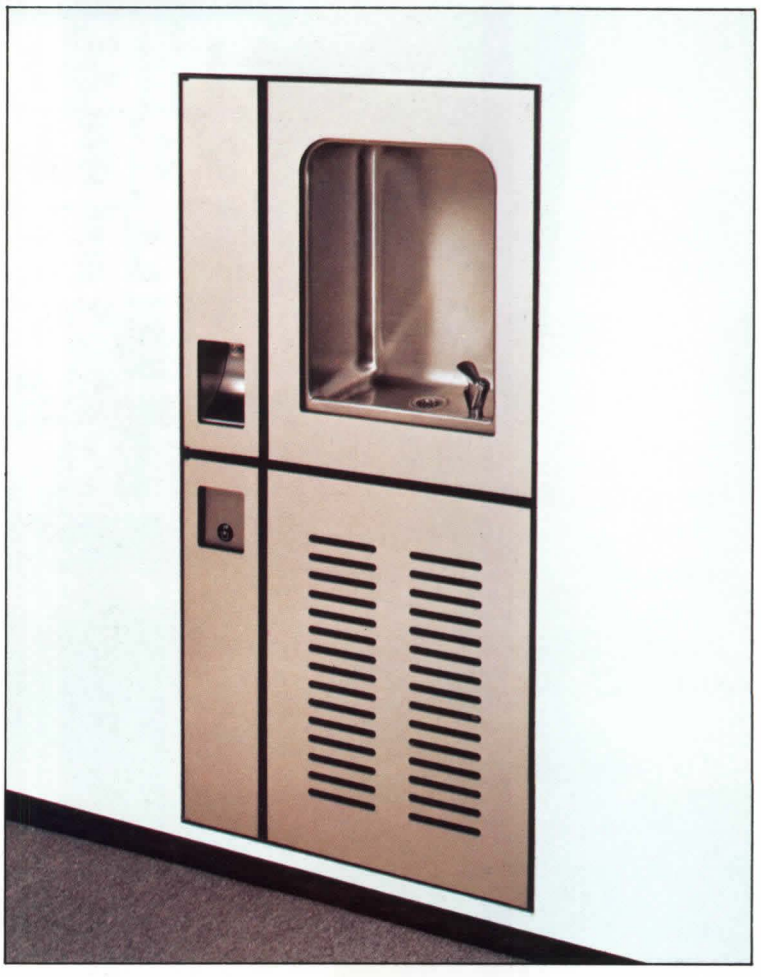

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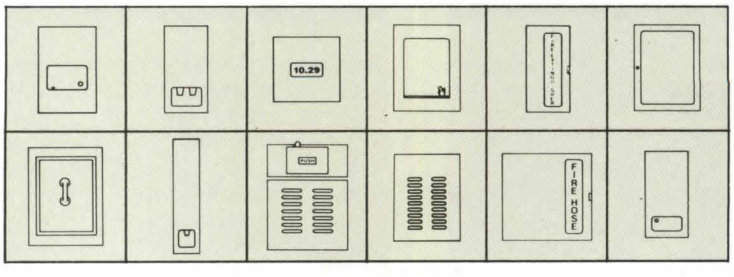

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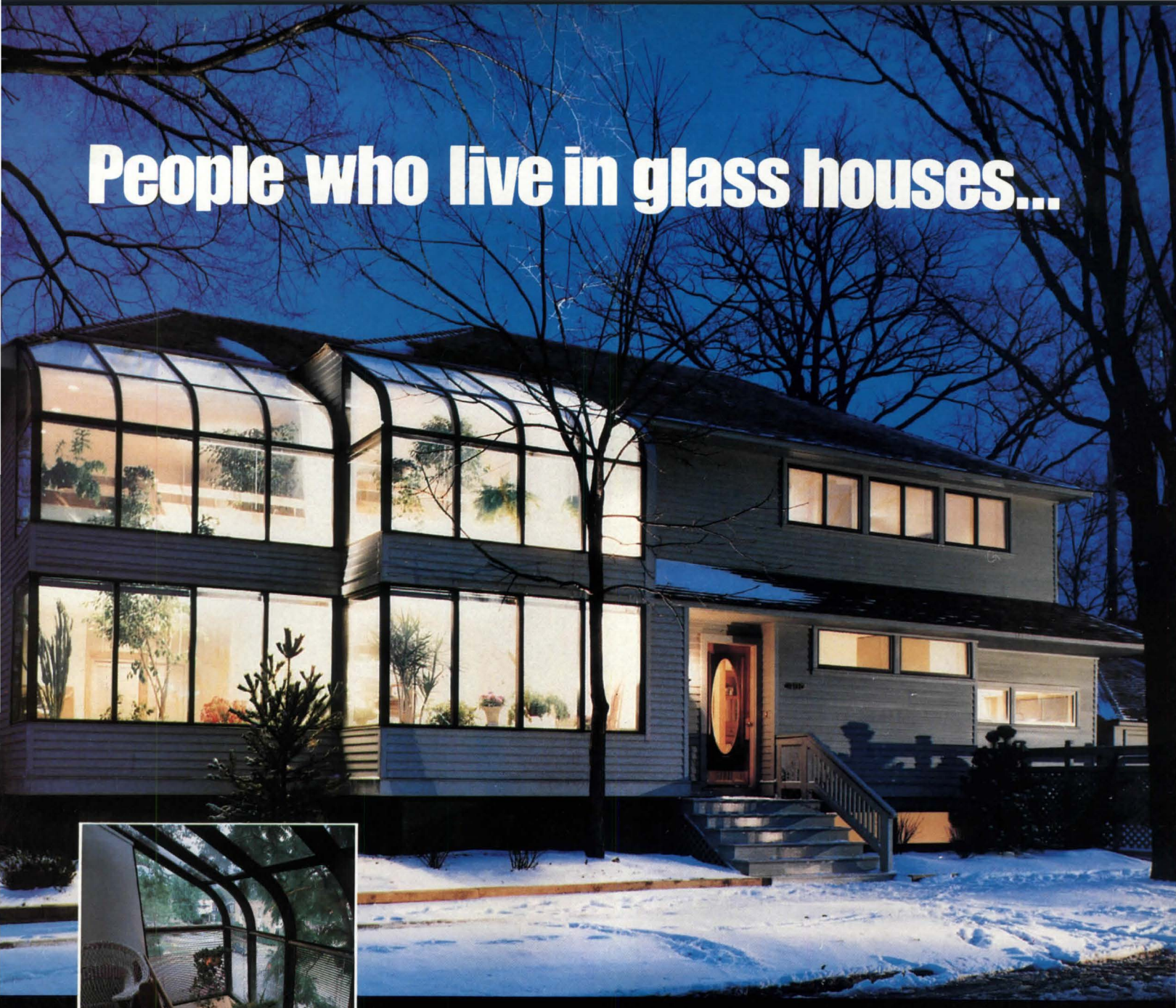

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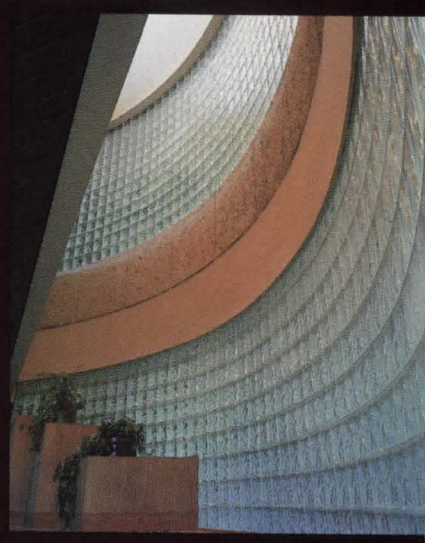

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P/A News report

In keeping with this issue's theme, November news includes a roundup of endangered landmarks, a review of the Colosseum "reconstruction," and other preservation news, plus Aalto at MoMA and Yale at the beach.

Colosseum controversy

A heated debate again rages about the proper use of ancient monuments in Rome. This time, the focus of attention is the Colosseum, symbol of the city, and its use as a museum space for the recent show "The Italian Economy Between the Two Wars 1919–1939" (through Nov. 18). The content of the exhibition, which will come to the United States in 1985, has aroused little criticism. Mounted by IPSOA (Istituto Postuniversitario per lo studio dell'Organizzazione Aziendale), it presents a nostalgic if uncritical picture of Italy in the 1920s and 1930s. The social and economic transformations of the Fascist era are documented through more than 1600 photo-panels and some carefully chosen relics of the period, including a gas pump, a wooden bicycle, and an original prototype of the Alfa Romeo Gran Sport.

Colosseum "reconstructed."

Instead, controversy has centered on the illustrious "container"—the Colosseum—and the alterations made to the monument for the exhibit. The most dramatic aspects of the project, designed by Danilo Parisio, Giovanni Ascarelli, Maurizio Macciocchi, and Evaristo Nicolao of Transit Design and executed by Cinecittà, include a reconstruction of the amphitheater's external ring, and one tier of seats, executed in a combination of metal sheeting, wood, and stretched fabric; construction of a 50-meter-high tower housing temporary entrance and exit stairs; and reconstruction of part of the wooden central arena. A metal walkway connecting the stair to the arena permits a view of the Colosseum's sublevels, juxtaposed against a prototype of Italy's first experimental helicopter displayed at one end of the floored area. A portion of the entrance passage has also been covered in fabric to simulate the originally closed interior volume.

Those who are against the show speak of

Pencil points

Robert Venturi *of Venturi, Rauch & Scott Brown has been commissioned to design a downtown branch for the Seattle Art Museum.*
- *Also in the running were William Pedersen of Kohn Pedersen Fox and Henry Cobb of I.M. Pei & Partners.*

The two Pauls*—Gapp and Goldberger—have crossed swords over Donald Trump's attempt to win the "tallest" title back for New York.*
- *The developer has sued Gapp and the* Chicago Tribune *for $500 million, claiming Gapp's criticism of his skyscraper concept has subjected him to "public ridicule . . . and financial harm."*
- *Goldberger took both Gapp and Trump to task in his* New York Times *review, terming the one a Chicago chauvinist and the other a shrewd self-publicist.*
- *As Goldberger reports, the* Tribune *allegedly fabricated its own rendering for Trump's tower, which the developer claims has not yet been designed.*

Pieces of the Chicago Stock Exchange *(Sullivan & Adler, 1893; demolished 1971) are now on sale. A 10'-12" section of the terra cotta cornice goes for $17,300; a double grill assembly from the elevator enclosure for $54,900.*
- *For a price list, contact Historic Productions, Box 285, Rt. 4, South Haven, Mich. 49090.*

Pieces of the superliner *United States were auctioned off in Norfolk, Va. The 1950s fittings should stock chic antique shops across the country for many months to come.*
- *The S.S.U.S. itself, launched in 1952 and mothballed in 1969, is to be refitted at a cost of $125 million.*

Fort McHenry, *site that inspired the Star-Spangled Banner, is to be restored, to the tune of $6 million, raised by private subscription.*
- *Efforts are underway to stabilize the seawall, part of which has collapsed, repair the fort, and expand the tiny tourist center.*

Frank Lloyd Wright's *Unity Temple is also undergoing restoration. Work should be completed in time for the building's anniversary next year, which is to be celebrated with lectures, exhibitions, and other events.*

the potential damage to the Colosseum through vastly increased use, and of the disjuncture between the content of the exposition and its container. Arguing principally on abstract ideological grounds, these opponents contend that a monument should be nothing other than a museum of itself. The idea of "reanimating" the Colosseum or of "returning it to the citizens," as the designers of the project claim to have done, to these critics is absurd. Such vestiges of the past should be left to their destiny as ruins; the only appropriate interventions are proper maintenance, restoration, and the provision of needed didactic information. Paolo Portoghesi sees this credo as particularly relevant in the case of the Colosseum, which he characterizes not only as a monument but as a "luogo sacro," a veritably sacred place.

Advocates of the exhibit argue that such rigid ideological stands will doom archeological ruins to decay and neglect. The project architects themselves defend the design as a didactic exercise: The reconstructed sections, they claim, bring to light historical, functional, and spatial aspects of the Colosseum today obfuscated by demolition and arbitrary restoration. They allow a reading of the amphitheater not only as a monument but as a complete architectural complex.

Adriano La Regina, Superintendent of Archeology for Rome and mastermind of the now infamous project for the valorization of the Roman Forum (see page 110), defends his authorization of the exposition on similar grounds. He argues that the use of ancient monuments for cultural events is not a black-and-white issue, but one which must be considered on a case-by-case basis. Blatantly exploitative proposals such as sound and light shows are to La Regina out of the question; however, uses that may benefit a monument—as in this instance, the didactic reconstruction and reintegration of a portion of the ruin—can be considered valid. Reversibility is always critical: In no case, La Regina argues, should a secondary utilization become permanent, thereby undermining the primary function of a monument as a historical document.

Photos: Jeanne Teutonico

Mixed metaphors: Fascist design displayed on a modern panel system in antiquity's arena (left). Metal and mesh recreate the exterior ring (above), internal seating, and central stage (above left).

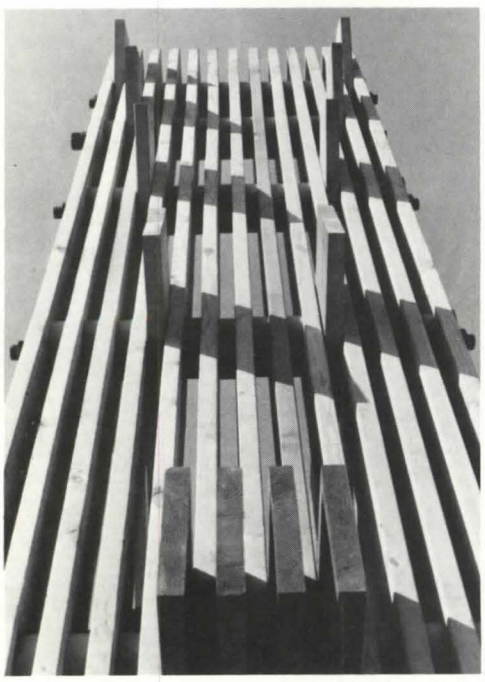
These high-minded arguments were no doubt bolstered by certain political and economic incentives. The exhibit has already proved to be a great commercial success. Moved by curiosity to view firsthand the structural interventions that have aroused so much furor, or by a desire to revel in reminiscences of the past, more than 50,000 people visited the show in its first two weeks. The $1.7 million expended, largely on construction, will clearly show returns. All rhetoric aside, however, this use of the Colosseum has set a dangerous precedent, one that may inspire far less creative and more abusive uses of ancient monuments in the future. ■

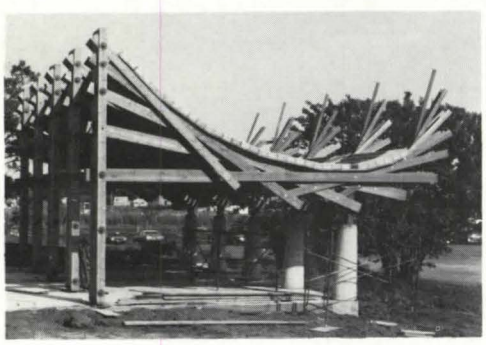
JEANNE MARIE TEUTONICO, *a graduate of the Columbia University Masters program in historic preservation, teaches and works at the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM) in Rome.*

Build your own at Yale

The traditional complaint voiced by practitioners against architectural students—that they don't know how to build—shouldn't apply to students at Yale University where the Building Project has been required of first-year Masters candidates since 1965. Each spring, student teams compete for a real commission, chosen by faculty and representatives of the city of New Haven. The whole class then participates in the detailing and construction of the winning design. Past projects have included a pavilion for the American Shakespeare Theatre in Stratford and last year's Summer Concert Stage on New Haven Green.

This year's winning team—Peg Chambers, Owen Foley, David Hotson, David Levitt, and Madeline Schwartzman—won over not only the official jury but a jury of their peers, polled in a schoolwide straw vote, with their $30,000, 1200-square-foot Beach Pavilion at Lighthouse Point (above). **[DDB]** ■



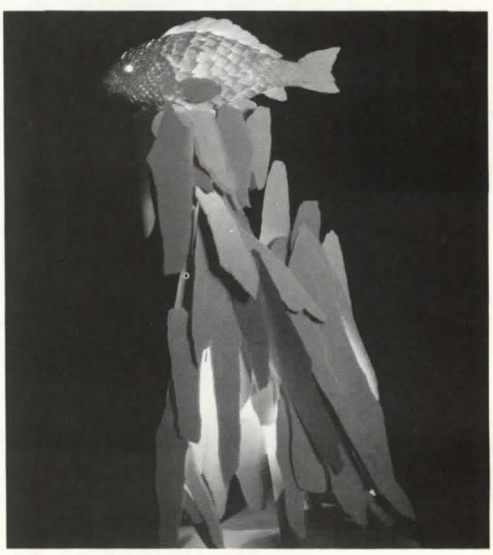


Photos: Madeline Schwartzman

Fish gotta swim, snakes gotta slither

Frank Gehry's first fish lamp, designed for Formica's Surface & Ornament program (P/A, Aug. 1983, p. 29), combined jagged, expressionistic forms with a seductive delicacy of color that resulted from illuminating the prescribed Colorcore material. Gehry was the only one of the group to "tear" the material, and the only one to explore its light-transmitting properties. This fish soon multiplied into a school, which surfaced last March at Larry Gagosian's gallery in Los Angeles along with two spectacular snake lamps (the other current of Gehry's animal-kingdom investigations). A second wave of scaly things is on the way, this time to the Atlantic coast, at Metro Pictures Gallery in New York, November 24–December 22. The show's 12 new pieces (and three older ones) offer a telling commentary on the evolution of the species. While the first fish lamps were about "a fish on a pedestal," the support has now become as important as the supported. In fact, some of the new lamps are so large that they almost require rooms of their own. "That's how I get architectural projects these days," Gehry quips. These mysterious creatures, produced by New City Editions of Venice, Calif., are quite a catch in art and architecture circles, having found their way into the collections of Philip Johnson and Jasper Johns, among others.

While the rich imagery and symbolic content of the fish and snakes pervade recent Gehry projects such as his entry in the "Follies" show at Leo Castelli (Dec. 1983, p. 24), and a theater project in Venice, on which Gehry collaborated with Coosje van Bruggen and Claes Oldenburg (who own a snake lamp), the architect would say of the lamps only that "the whole thing is a kind of intuitive exploration." It is clear, however, that Gehry would love to take these fish from lamp-size to building-size, a major change in scale(s). **[PV]** ■



Photos: Larry Harris

Gehry's menagerie.

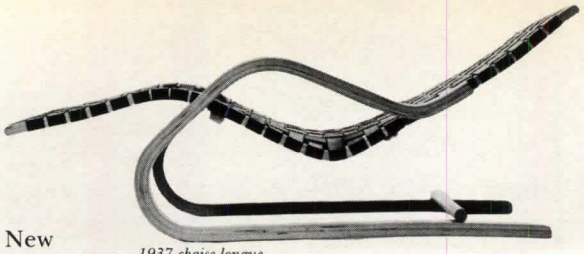
Aalto encore

In 1938, the Museum of Modern Art in New York hosted a show devoted to the buildings and furniture of Alvar Aalto. It was the first museum show to recognize the Finnish architect. Almost 50 years later, MoMA has returned to the subject in a retrospective entitled "Alvar Aalto: Furniture and Glass." The show, which runs through Nov. 27 in New York and then travels, is the fourth in a series on the furniture and interiors designed by 20th-Century architects Charles Eames, Mies van der Rohe, and Marcel Breuer.

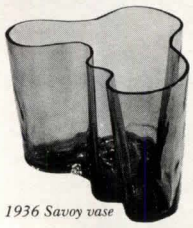
The show and short film on production are unabashedly didactic. We are made to understand how wood works—its limitations and potential—so that Aalto's innovations can be fully appreciated. The accompanying catalog by J. Stewart Johnson, while less extensive than that produced by Christopher Wilk for the 1981 Breuer show, is a crisp, chronological analysis of function as reflected in form. Johnson documents the evolution of each element, tracing, for example, the development of support from the L-leg of 1929 through the 1947 Y-leg to its "ultimate refinement," the fan-shaped form of 1954. Aalto's designs in glass, a freer, more malleable material, are selected to illustrate a parallel evolution from the 1933 prize-winning "Flower of Riihimaki," a series of rather stiff but elegant stackable bowls, to the later, more organic work typified by the well-known 1936 Savoy vase. Also included is a 1932 design for a pressed-glass pitcher and tumblers by Aino Aalto, the architect's first wife and collaborator.

The show's only real surprises are a series of prototypes documenting Aalto's unsuccessful attempts to design in tubular steel, the material so favored by his contemporaries Mart Stam, Mies, and Breuer. An awkward, overdesigned metal and plywood examination table produced for the Paimio Sanitorium in 1931 and two clumsy stacking metal and plywood cantilevered chairs of 1930–32 lack the grace and simplicity of Aalto's work in plywood alone. The architect himself found the material unsympathetic if efficient: "The tubular steel chair is surely rational from technical and constructive points of view; it is light, suitable for mass production and so on. But steel and chromium surfaces are not satisfactory from the human point of view. . . ."

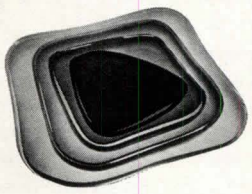
MoMA's audience will no doubt find most of this material familiar and for good reason: A number of the pieces have been on the market for years, and others have been recently reissued, including the 400 Chair from



1937 chaise longue

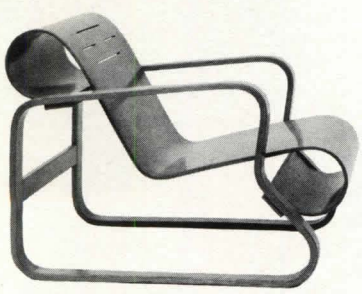


1936 Savoy vase



1936 stacking plates

1954 stool



1932 Paimio

1936 lounge

1935 stool

Photos: Courtesy MoMA

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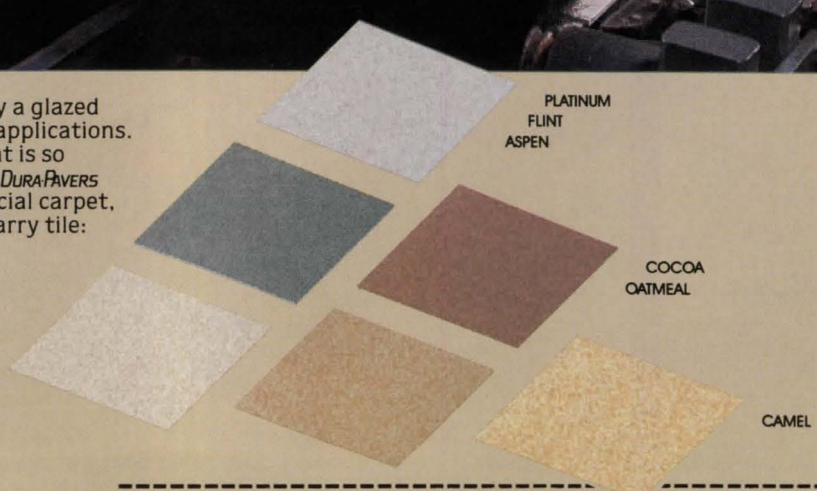

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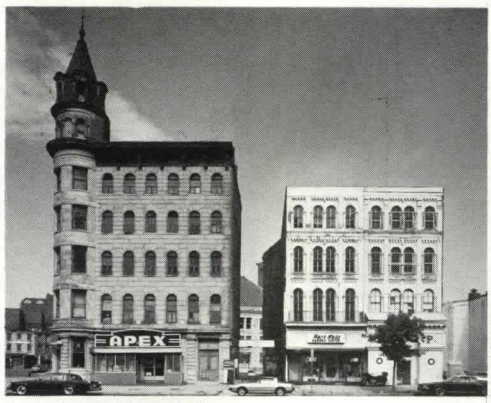
P/A News report

ICF (P/A, Sept. 1984, p. 119). ICF, American distributor for Aalto furniture since 1962, together with Artek, the Finnish Society of Crafts and Design, and the Finnish Ministry of Education, sponsored the show; the publication was supported in part by Lighting Associates. The exhibition will travel to the Block Gallery in Evanston, Ill.; then to the Akron Art Museum, Ohio; the Musée des Arts Décoratifs, Montreal; MIT, Cambridge, Mass.; and the Chrysler Museum, Norfolk, Va. [DDB] ■

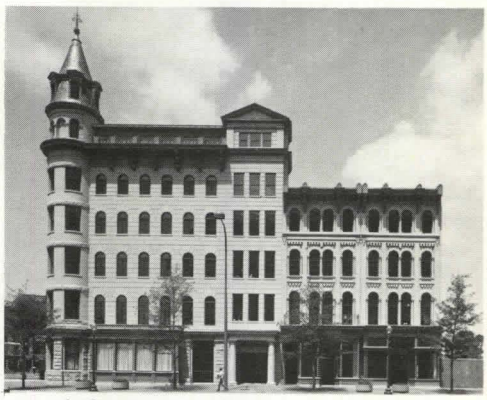
Artek

Aalto exhibit at 1936 Milan Triennale.



Arnold Kramer

Sears World Trade before . . .



Harlan Hambright

. . . and after.

Preserving a piece of commercial Washington

In a city plagued by ill-conceived architectural hybrids of past and present (see P/A, June 1983, pp. 41 & 43), the new Sears World Headquarters in Washington, D.C., is admirable for its restraint. The national corporation and its architects Geier Brown Renfrow (Hartman Cox, conceptual design 1981–82) chose to renovate and reintegrate three landmarks dating from the Civil War period that occupy perhaps the most visible corner site on Pennsylvania Avenue (bar one).

The original St. Marc Hotel dates from the mid-1860s and is an early example of fire-resistant construction in Washington. Its distinctive corner towers are the work of architect Alfred B. Mullett, commissioned by the Central National Bank in 1887 to convert the hotel to commercial use. Adjacent to this corner building on Pennsylvania Avenue are two smaller, Italianate commercial structures: one the site of Civil War photographer Matthew B. Brady's studio and home of the National Photographic Art Gallery from 1858 to 1881; the other site of Z.D. Gilman's Drugstore, oldest establishment in continuous operation in the country at the time of its closing in 1965.

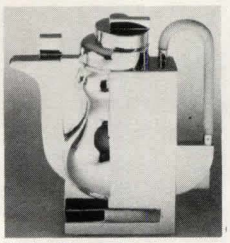
Sears' program required the addition of a sixth floor behind the towers and the insertion of a new building linking the corner hotel/bank with the Brady building. All interior circulation has been concentrated in this connecting piece, articulated on the north and south façades to appear distinct from, yet related to Mullett's landmark. The original west, north, and south façades have been cleaned and restored, although the cornerstone of the hotel's north façade had deteriorated to such an extent that the architects chose to demolish it above the second floor and rebuild in cast stone. Interiors have been designed to suit contemporary office

use. Cast-iron columns and a lovely stair have been retained; in addition, storefronts, altered over time, have been replaced with facsimiles, and wainscoting, door, and window details were repaired or replaced, reflecting actual site evidence or period research. This rare, complete piece of Civil War Washington, so carefully reconstructed, should inspire future efforts in the Pennsylvania Avenue National Historic District. **[DDB]** ■

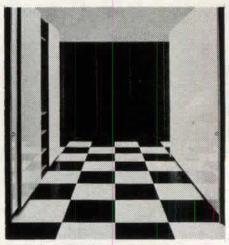
Compasso d'Oro: Italian design debate

The biennial Compasso d'Oro competition was founded by La Rinascente 30 years ago to recognize good Italian design. The department store chain promoted Compasso d'Oro for several years, until the Association for Industrial Design (A.D.I.) took over.

The mechanism of the award is quite simple: ADI mailed 5000 invitation entries to firms, industrial associations, architects, and designers. A jury of five was then chosen to examine the entries and make a final judgment. Giotto Stoppino, ADI president, architect and designer; Cini Boeri, architect and designer; Douglas Kelley, architect; Anti Nuresniemi, Finnish entrepreneur; and Bruno Zevi, architectural critic met for four days in July to study the literature, photographs, blueprints, catalogs, and brochures representing the entries. Out of 618 submissions, 34 product designs were selected, together with some work in graphic research and promotion.



Meier Tea pot.



Max Protetch Gallery, New York

B&B, Kairos Closet.

Quasar, Tender cycle.

A more thorough examination took place in September, when the jurors met a second time to inspect items individually: At that point the verdict was given and awards granted, based on aesthetics, technique, and function. Seven product designs were awarded the Compasso d'Oro: Alessi's stainless steel flatware designed by Achille Castiglioni, and sterling silver tea set by Richard Meier; B&B Italia's closet by Studio Kairos; Olivetti's cashier Mercator 20 by Mario Bellini, and metalwork machine by Rodolfo Bonetto; Quasar's Tender, a compact motorcycle, by Italo Cammarata; and Vorwerk Folletto's floor polisher and washer. Three additional compasses were awarded to the graphic program for Fusital, designed by Bob Noorda, and those for RAI (Italian Radio and Television) and the Italian Socialist Party designed by Ettore Vitale. Fiat designer Giorgetto Giugiaro received a special Compasso d'Oro, as did Alitalia for its promotion program and bureau design.

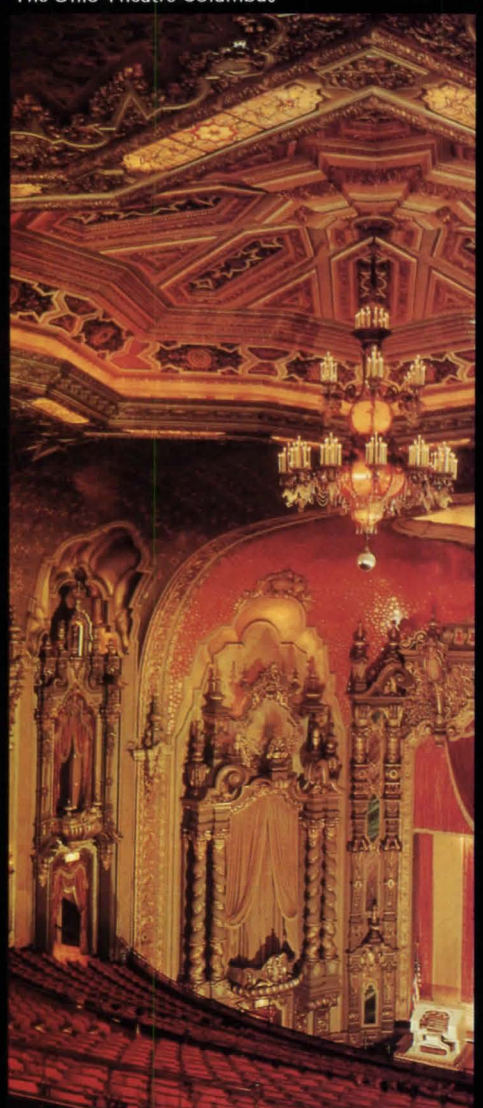
The awards were greeted in Italy with some controversy. The more negative critics claimed that the jury had "played it safe" by selecting the well-known Olivetti and Bellini; they had rewarded the Socialist Party (the city of Milan, which partially sponsors the competition, has a socialist administration); and they had, in selecting Meier's tea set, chosen a costly, handcrafted artwork, not an industrial product.

Mr. Stoppino is totally indifferent to such criticism, stating, "We have done our duty to be as objective as possible." Mr. Nurmesniemi is "quite pleased with the experience," and he advocates a "European Compasso d'Oro." Ms. Boeri has some complaints: The rules were wrong in requiring at least seven Compassi D'Oro, and the jury was not free to make a more restricted choice. Moreover, the items were not considered in terms of price, commercial distribution, or quality testing.

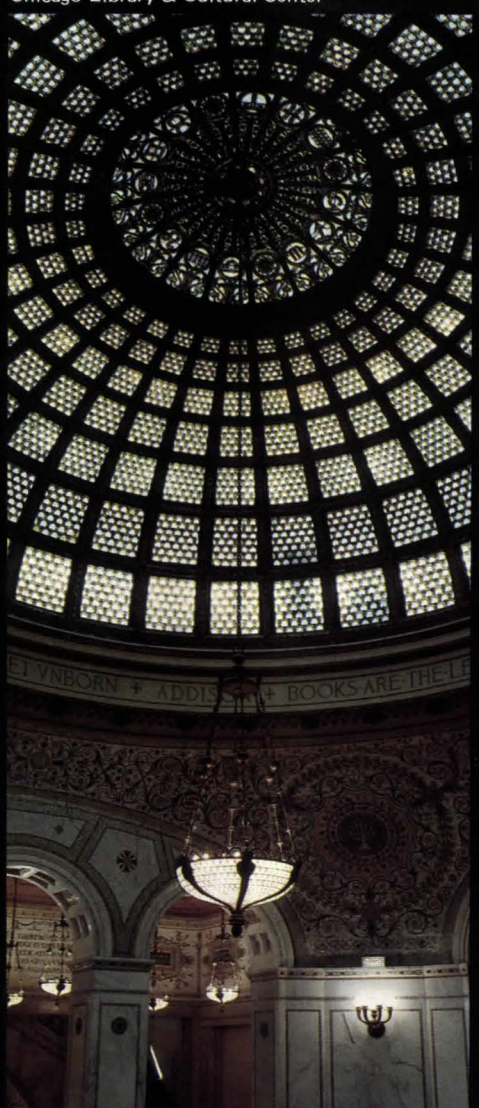
Some design leaders and opinion makers have a more disturbing conclusion: If the general level of Italian production is rising,

Rambusch restoreth what time taketh away.

The Ohio Theatre-Columbus



Chicago Library & Cultural Center



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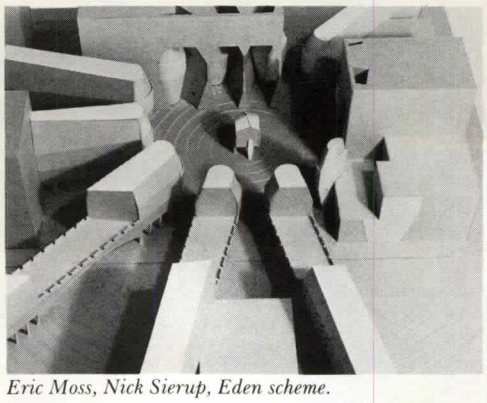
the number of new ideas is drastically decreasing. English designer Zeev Aram comments: "The field of Italian design has been overfertilized in the past years. This is not to say that it produces nothing valuable, but we are witnessing the aftermath of a very active period." [DONATELLA SMETANA] ■

Expelled from Eden?

The Garden of Eden thrives on New York's Lower East Side, tended by resident gardener Adam Purple, who created it from rubble and horse manure ten years ago. But Adam's garden may not be there much longer if the New York City Housing Authority has its way. Recipient of a HUD grant, which will be withdrawn if ground is not broken by the first of the year, NYCHA is understandably eager to start building a low-rise low-income housing project—on the site that now supports the Garden. Some local politicians and community advocates view the housing project as a civic priority and fail to see why the Garden should be preserved. Other members of the community feel that the Garden is a work of art and a necessary oasis on the burnt-out Lower East Side. Searching for alternatives that might satisfy both sides, Kyong Park and Glenn Weiss of the Storefront for Art and Architecture invited a number of architects, both known and unknown, to contribute designs for low-rise housing that would spare the Garden from the bulldozers and make it part of the built project. A wide range of architects responded from the U.S., Europe and Japan, and their work was put on public view at the Storefront (Sept. 13–Oct. 7).

Brian Patrick O'Donoghue

Eden on the Lower East Side.



Michael Moran

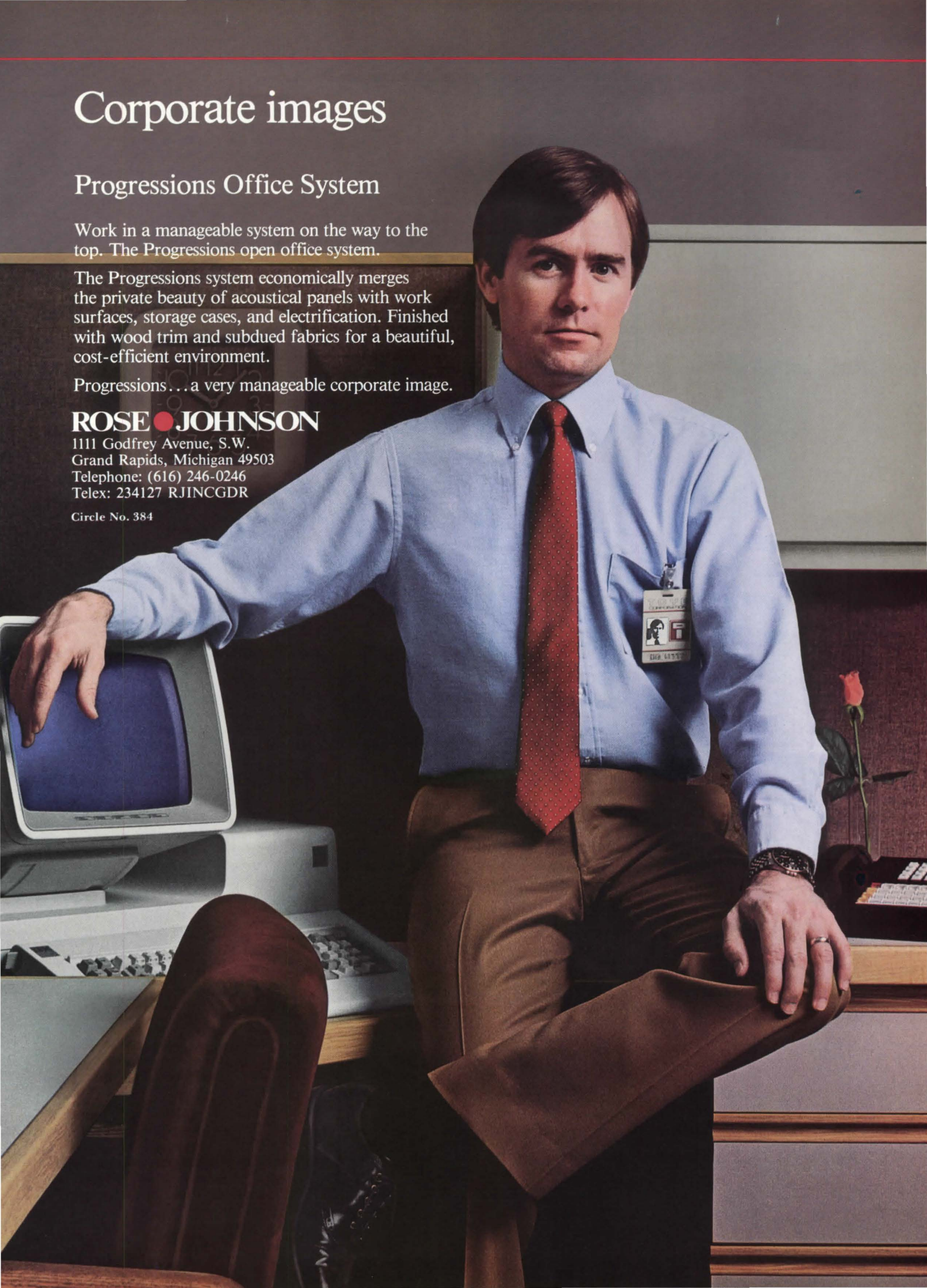
Eric Moss, Nick Sierup, Eden scheme.

Since contextuality is a meaningless word in terms of the gap-toothed, rubble-strewn site, most of the architects adopted the Garden's own yin-yang-centered spiral as their organizing metaphor. Eric Owen Moss's project is an appealing example, with its purple concentric circles tilled by tiny stooping figures. Also notable was Sarah Drury's photocollage/frieze. While not a project per se, Drury's piece sensitively evoked the broken-puzzle-piece nature of the site. Other interesting proposals for the site included those sent by Japanese architect Shin Takamatsu and New Yorkers Lebbeus Woods and Dan Coma.

Post-show developments suggest that New York's Garden of Eden may be spared the fate of its namesake. In early October, the Housing Authority filed for a six-month extension of the HUD loan, in order to study the feasibility of allowing the Garden to remain. [JW] ■

Whither Little Tokyo?

Craig Hodgetts and Hsin-Ming Fung were the winners of a design charrette organized by the Architecture & Design Support Group of The Museum of Contemporary Art, Los Angeles, and held August 24–26 at the Museum's Temporary Contemporary. Six design teams, chosen from a field of 20, were asked to come up with a solution to the problem of what to do with an 11-acre site in Little Tokyo, bounded by First, San Pedro, Temple, and Alameda Streets, and sur-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Seymour Rosen

The Watts Towers, Los Angeles, Calif. In the late 1970s, Simon Rodia's Watts Towers were discovered to be in such poor condition that the site had to be closed to the public. Scaffolding erected then remains in place some six years later, as the Towers, probably the best known folk-art structures in the country, undergo slow restoration by the State of California Parks program.

Seymour Rosen

Nit Wit Ridge, Cambria Pines, Calif. Art Beal, a.k.a. Dr. Tinkerpaws, has spent over 50 years in the construction of Nit Wit Ridge, a complex of wood, stone and concrete buildings climbing a terraced cliff. Nit Wit Ridge, a California State landmark, is currently threatened by vandalism, landslides, and water erosion. Mr. Beal, who still lives on the property, is unable to maintain it without assistance, and The Art Beal Foundation and SPACES (Saving and Preserving Arts and Cultural Environments) have stepped in.

Gamma-Liaison

Bottle Village, Simi Valley, Calif. Builder Tressa "Grandma" Prisbrey began constructing Bottle Village out of found materials in 1956. By 1972 there were 22 structures, built mainly of bottles set in concrete. Although the Village, a California State Historic Landmark, is now, finally, in the hands of a sympathetic owner, it suffers from age and neglect and is badly in need of restoration. The Preserve Bottle Village Committee has been active in raising funds for this purpose, as has the Ventura County AIA.

Acknowledgments
Nancy Gerber, Preservation League of New York State; Emily Harris, Landmarks Preservation Council of Illinois; Lane Ittleson, Historic Denver; Charles Lay, Committee for Heritage Conservation; Michael Leccese, *Preservation News;* Patricia Maher, Stanley Hotel; Steven Rebuck, Art Beal Foundation; Seymour Rosen, SPACES; Clark Strickland, National Trust for Historic Preservation, Denver; Richard Striner, Art Deco Society of Washington, D.C. [JW] ■

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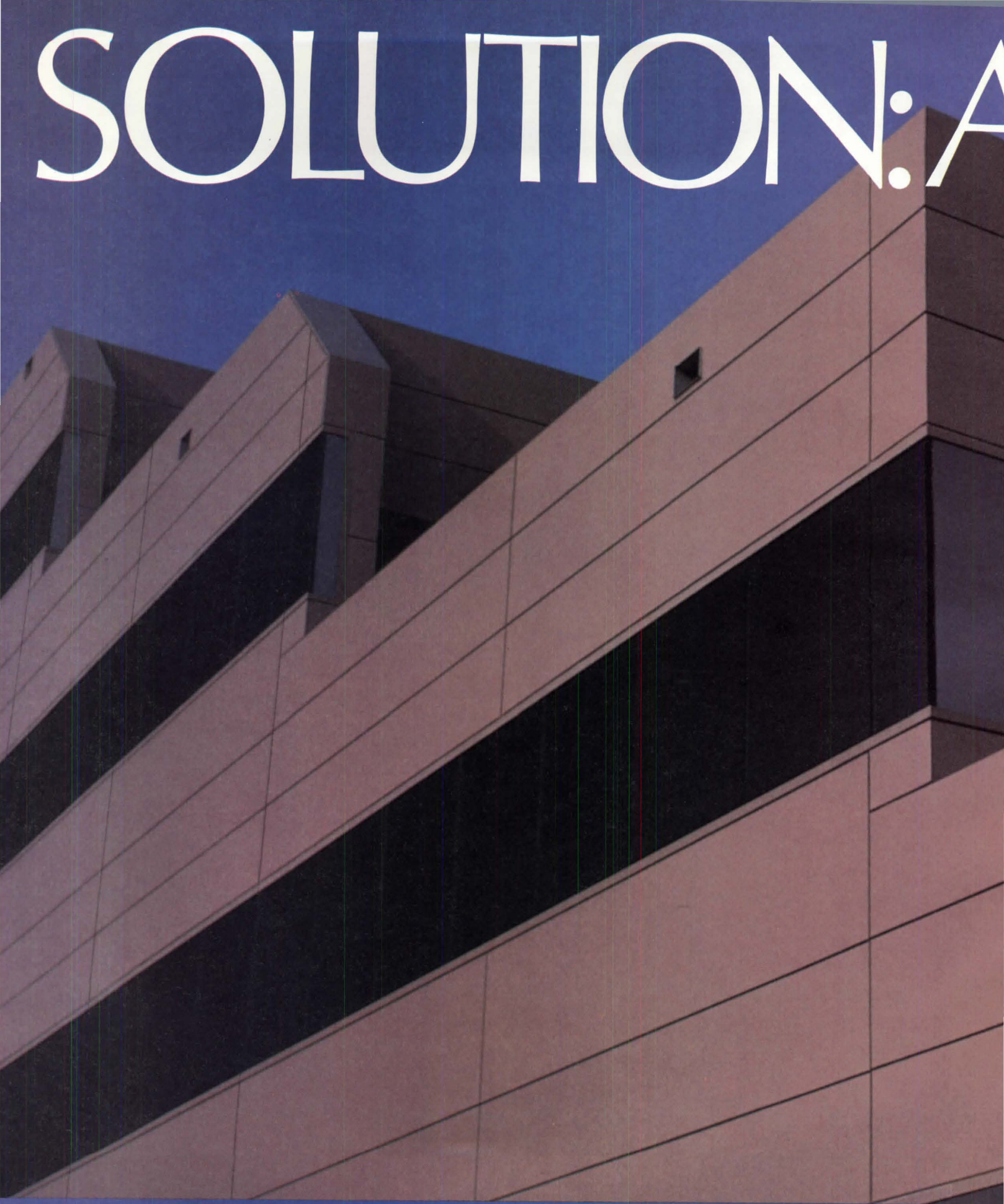

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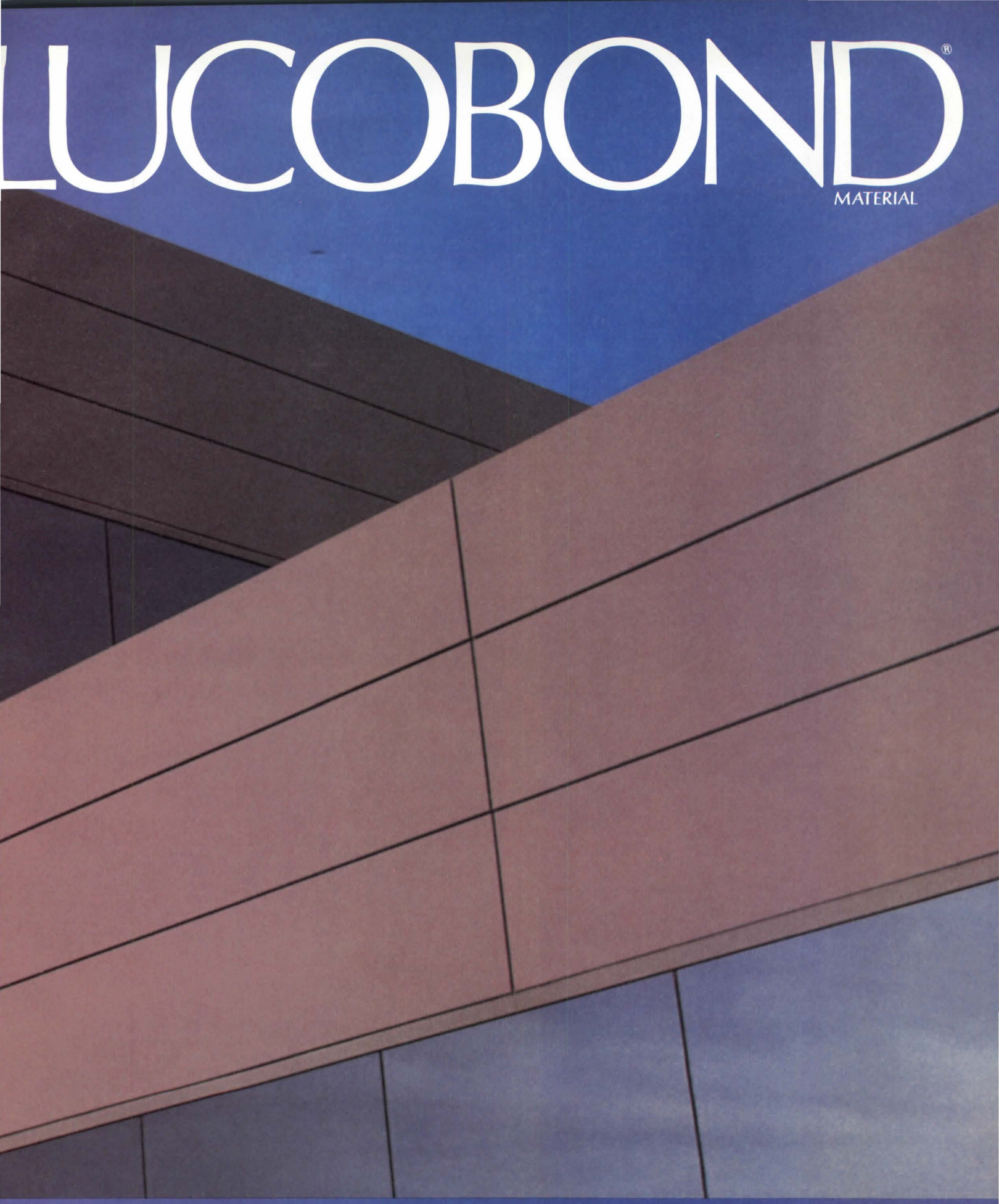

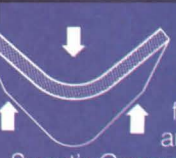

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P/A Calendar

Exhibits

Through November 23
Carlo Scarpa: Drawings for the Brion Family Cemetery. School of Architecture, Yale University, New Haven, Conn.

Through November 24
The Wonderwall: Drawings & Photographs from the New Orleans World's Fair. Philippe Bonnafont Gallery, San Francisco.

Through November 24
Piet Mondrian: The Wall Works, 1943–44. Carpenter + Hochman Gallery, New York.

Through November 24
Le Corbusier: Paintings, Drawings and Collages. Xavier Fourcade Gallery, New York.

Through November 26
Neo-Classical Chicago: 1893–1929. ArchiCenter, Chicago.

Through November 27
Alvar Aalto: Furniture and Glass. Museum of Modern Art, New York.

Through November 28
Otto Wagner, 1841–1918: Exhibition of 400 Original Drawings. The Academy of Fine Arts, Vienna, Austria.

Through November 30
Phoenix: An Exhibition of New Design Works. Queen's Quay Terminal, Toronto, Canada.

Through December 1
Le Corbusier: Paintings, Collages, Drawings—1922–62. Prakapas Gallery, New York. Also, **January 11–March 2,** J.J.P. Oud: Architectural Drawings and Photographs.

Through December 9
Heinz Isler: Thin Concrete Shells—A Structural Art Form. Theater Gallery, University Art Museum, Berkeley, Calif.

Through December 21
Great Architectural Drawings from the Royal Institute of British Architects. Ransom Center, University of Texas, Austin.

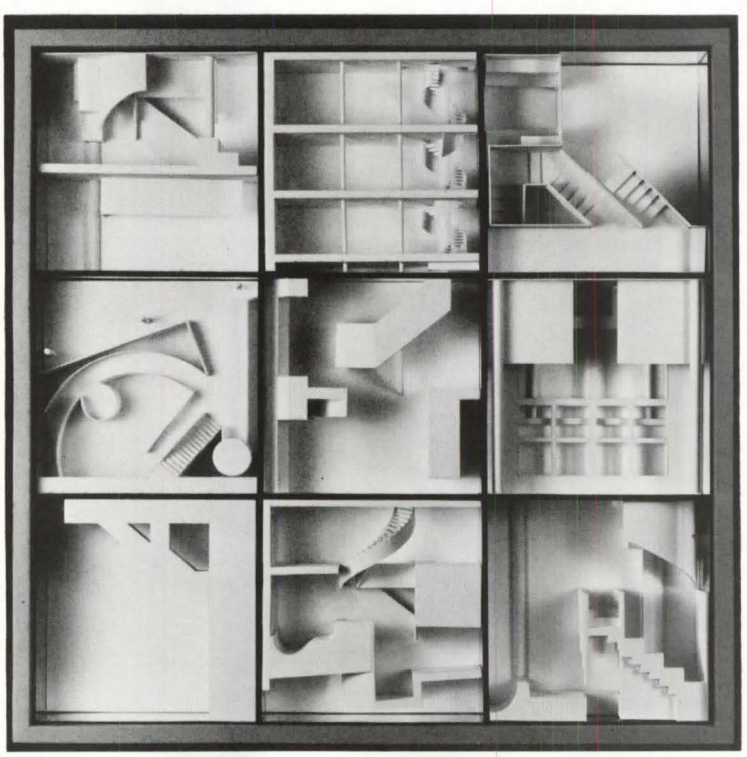
Through December 22
Origamic Architecture: Masahiro Chatani. Gallery 91, New York.

Through January 6
Chicago and New York: A Century of Architectural Interaction. The Octagon, Washington, D.C.

Through January 6
A Serious Chair, designed by Bill Stumpf and Don Chadwick. Walker Art Center, Minneapolis, Minn.

November 17–December 16
The Magic of Neon: Photographs & Sculpture. American Institute of Architects Building, Washington, D.C.

November 19–December 12
Three New York Firms: Peter Gluck and Associates, Architects; Rivkin/Weissman, Architects; Tod Williams & Associates, Architects. Avery Hall, The Graduate School of Architecture & Planning, Columbia University.



Courtesy Chicago Historical Society

G. Dagdelen, projects. Chicago Women in Architecture, through March 17.

Through January 13
Visions of Liberty: photographs of the Statue of Liberty. The New York Historical Society, New York.

Through February 17
White City: International Style Architecture in Israel. The Jewish Museum, New York.

Through March 17
Chicago Women in Architecture: Progress & Evolution, 1974–1984. Chicago Historical Society, Chicago.

November 28–December 28
Barbara Stauffacher Solomon: Grids on the Port of Saint Francis. Philippe Bonnafont Gallery, San Francisco.

December 8–January 20
Arquitectonica: Yesterday, Today, Tomorrow. Center for the Fine Arts, Miami, Fla.

December 16–February 17
Hockney Paints the Stage. The Fort Worth Art Museum, Fort Worth, Texas. Also **March 28–May 26,** The San Francisco Museum of Modern Art.

Competitions

December 1
Entry deadline, 1985 Tucker Architectural Awards program, sponsored by Building Stone Institute. Contact BSI, 420 Lexington Avenue, New York, N.Y. 10170 (212) 490-2530.

December 31
Postmark deadline, First Annual Kitchen Design Awards. Contact ICF, 305 E. 63rd St., New York, N.Y. 10021, or any local ICF showroom.

December 31
Postmark deadline, "Light in the 21st Century," international lighting design competition. Contact Ziggurat, Lighting Competition, P.O. Box 2654, La Jolla, Calif. 92038 (619) 299-1686.

January 17
Postmark deadline, P/A's 5th annual International Furniture Competition. See p. 143 for information and entry form.

Conferences, seminars, workshops

November 27–30
International Symposium on Architectural Fabric Structures: The Design Process. Hyatt Orlando Hotel, Orlando, Fla. Contact David L. Stumph, Symposium Manager, 1800 Pickwick Avenue, Glenview, Ill. 60025 (312) 724-7700.

January 9–12
Heimtextil, interior textile trade show. Frankfurt Fair Grounds, Frankfurt, West Germany. Contact German American Chamber of Commerce, 666 Fifth Ave., New York, N.Y. 10103 (212) 974-8830.

January 9–14
International Lighting Exposition 85, Parc des Expositions, Porte de Versailles, Paris. Contact Salon International du Luminaire, 22 av. Franklin-Roosevelt, 75008 Paris, France (1) 225-70-94.

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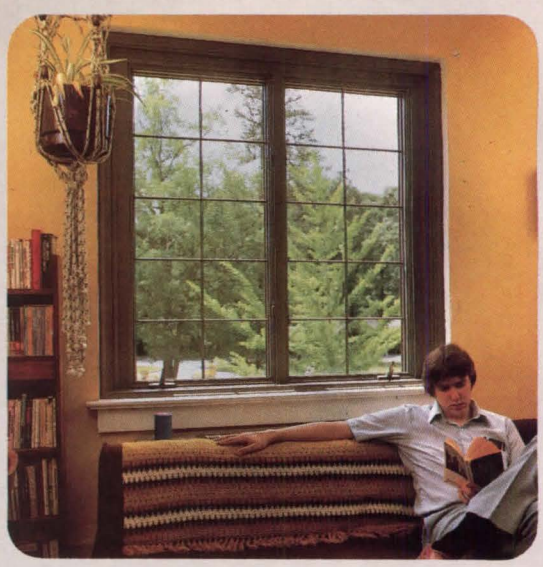

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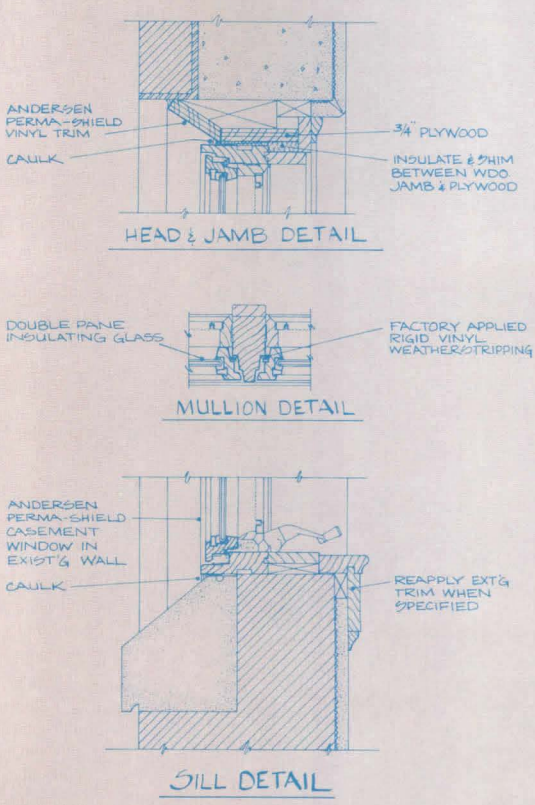

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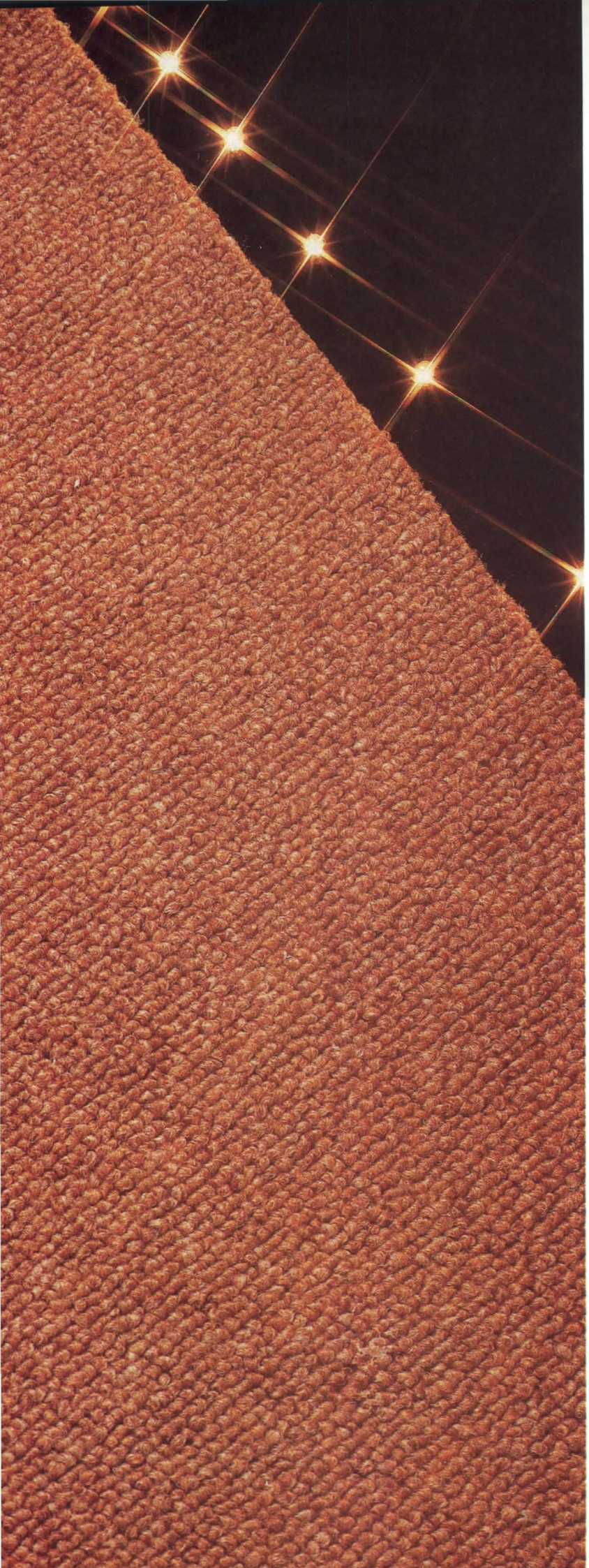

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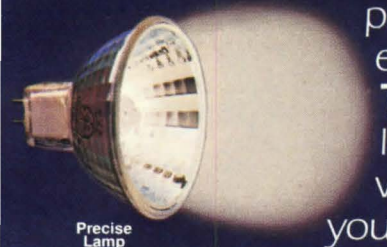

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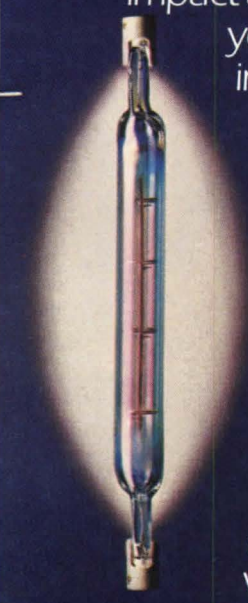

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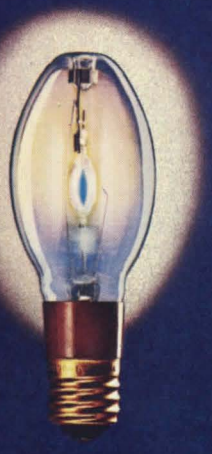

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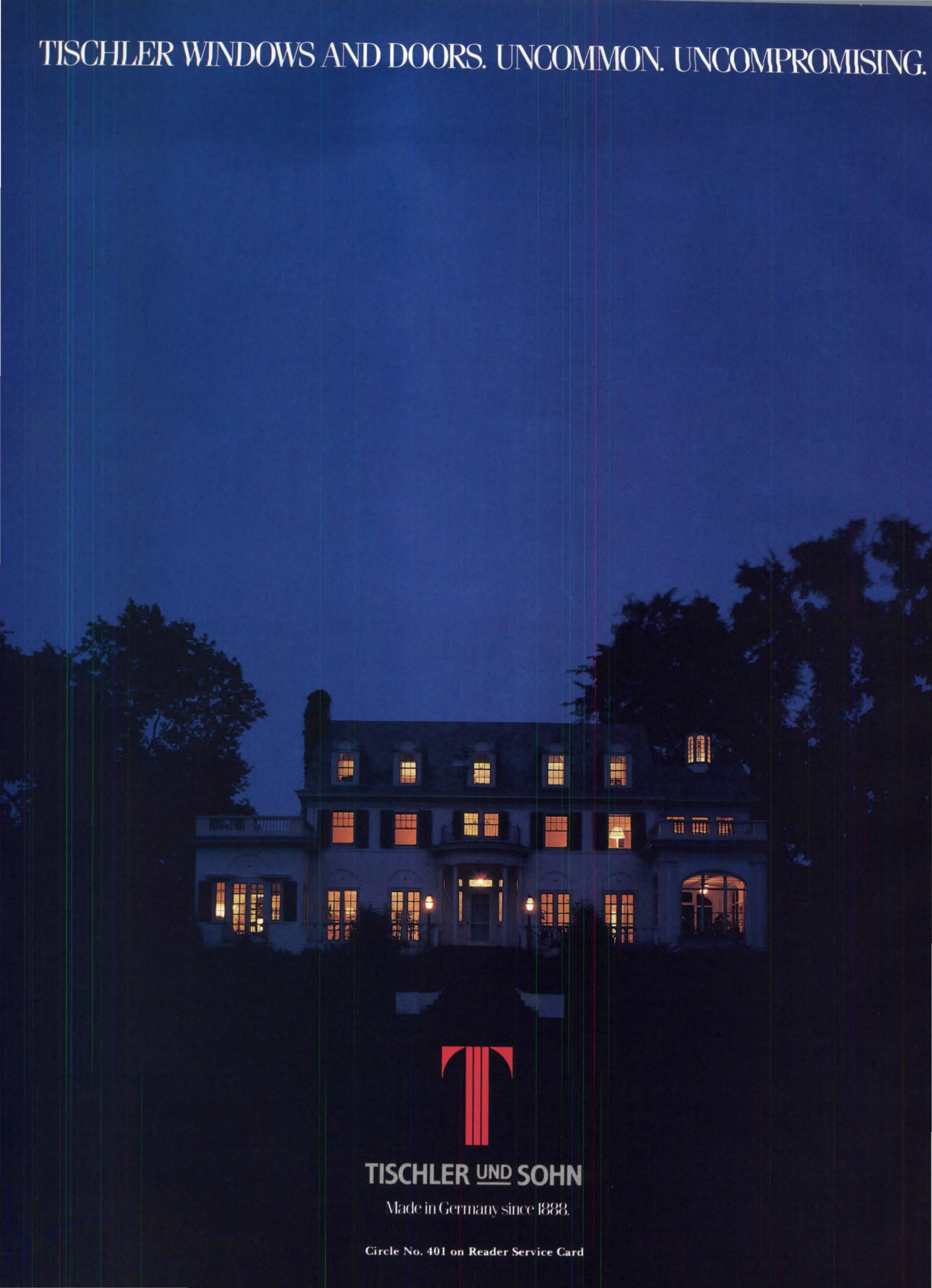

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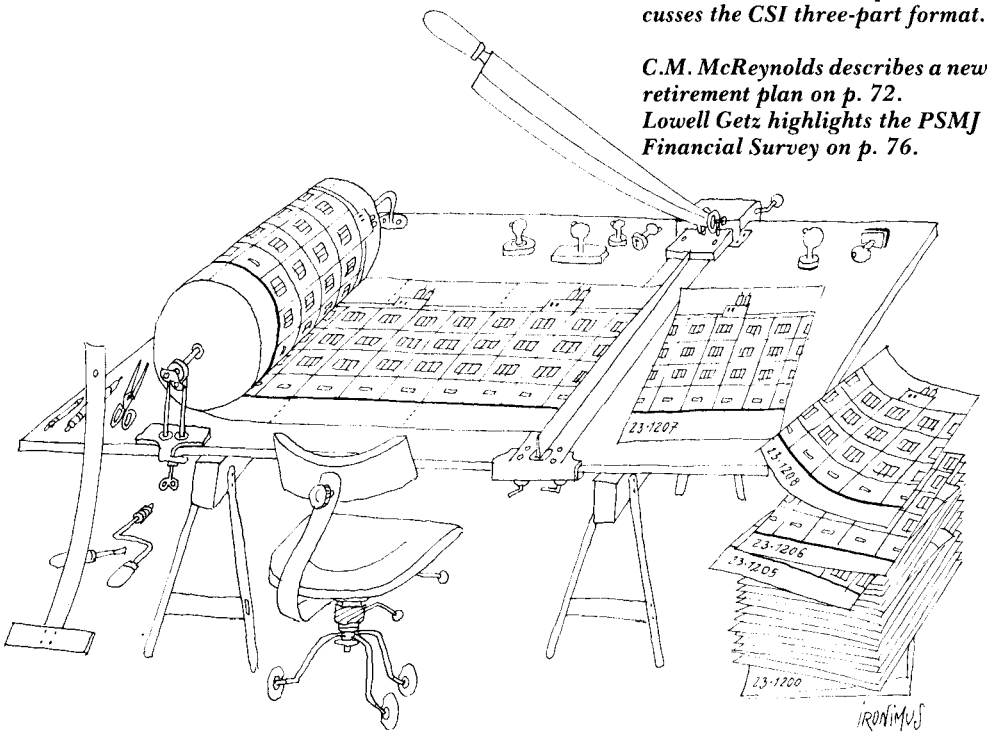
P/A Practice

On p. 69, Bruce Coleman describes a new systems drafting method.
William Lohmann, on p. 70, discusses the CSI three-part format.

C.M. McReynolds describes a new retirement plan on p. 72.
Lowell Getz highlights the PSMJ Financial Survey on p. 76.

When you can't afford systems drafting



From GruneHelden GraveMonster *by Ironimus, © Wilhelm Goldmann Verlag, Munich, 1983.*

In recent articles (P/A, Feb. 1984 and April 1984) that addressed the subject of systems drafting, it became clear that overlay or pinbar drafting has many advantages, including increased accuracy, increased control by the architect, reduced time, and most important, reduced cost. To save money with overlay drafting, though, you must spend some money. It is here that the difficulty arises for very small offices, those of one to five persons. While these firms do a tremendous volume of work, it usually is not complex and yields small fees. At some point, the fee coming in begins to collide with the minimum cost of implementing overlay drafting, at least as it is usually done.

Remember that the typical overlay drafting process entails drawing in layers, photographing each layer, producing a negative of each layer, and then, for the final positive composite, making multiple exposures (nicknamed burns). There is, naturally, a cost for each negative, for the composite, and for each burn. In my area (Syracuse, N.Y.) the negatives run around $10 each and a small composite (24″ x 36″) around $25 plus $3.50 per burn. A large composite (36″ x 42″) costs about $32, again with an additional cost per burn. Thus a final composite may run somewhere between $60 and $100 or more depending upon size and number of layers. For the very small office, such a cost, just to reproduce the final drawings, would be devastating. (Among 13 very small offices in my area, virtually none of them currently uses or plans to use overlay drafting.)

The very small office can obtain many, although not all, of the benefits of overlay drafting at a fraction of the cost. The element that must be bypassed is the camera, which costs most of the money. The reproduction house, and companies that market photographic products, will tell you that only the camera can provide sufficient resolution, registration, and accuracy, but that is not necessarily the case. Because of the high cost of photoreproduction, most firms, for intermediate check prints, will turn to a device called the vacuum frame. If they can afford one, it will cost from $3000 to over $5000. The vacuum frame looks like a light table with a fold-down lid. Original drawings (usually punched Mylars) or intermediates are placed face down on the glass. If there is more than one drawing (and that is the whole point of overlay drafting), the layers are simply stacked. A sheet of diazo print paper is placed face down on the top. In lieu of diazo paper, you can use sepia paper or Mylar sepia. Each layer in this sandwich is held in registration by a pinbar or small grommets. The vacuum frame is then closed, the vacuum pump extracts any air to assure a tight sandwich eliminating distortion, a timed light exposure is made, and the machine opened up. The medium is then processed through the ammonia section of a normal diazo printing machine. The cost? My reproduction house charges around $.25 per square foot, or $1.50 to $2.25 for a composite print or sepia compared to $60 to $100 for the camera-made version. While these specific costs apply to my area only, the dramatic difference between the two processes should hold true everywhere.

The lower cost means that the system can be implemented much earlier in the design process than is common with most systems drafting. It is quite possible, indeed very easy, to do building analysis using overlays in the feasibility stage, to overlay different façade or fenestration proposals in the design stage, to propose to the client a number of different solutions to a project, or, with renovation projects, to document the existing conditions (as one layer) and indicate the proposed renovations (as another layer) without redrawing.

The vacuum frame process has some noteworthy limitations. The photographic method, where each exposure for the composite is done separately, will reproduce any number of layers; seven- to ten-layer composites are not uncommon. Since the vacuum frame holds all of the layers at the same time, the sandwich becomes too thick and resolution deteriorates beyond three or four layers. For complex projects, this presents a severe limitation. Yet the majority of the projects done by very small offices have a complexity that rarely requires more than three layers. Typically, one layer contains the title block, one the base plan, and one the trade-specific layer. You can beat the layer limit by making a xerographic copy of the title block on an appliqué or transfer sheet and by printing three or four layers onto a positive polyester reproducible (Mylar sepia or slick) on the vacuum frame. The final composite is made by printing the reproducibles, again on the vacuum frame.

Another minor limitation occurs with screened layers using tint sheets. The vacuum frame produces results that are generally acceptable but not quite as good, or as flexible, as photographed sheets. The reproduction houses and their suppliers would have you believe that photographic reproduction offers the only means of generating an accurate reproduction. But I have seen enough out-of-register composites made photographically to convince me that it is not the process but rather the operator that is the key.

Clearly, the vacuum frame system is not for all firms or projects. When the complexity of the project warrants (and the fee allows), the camera certainly provides the best way of reproducing more simultaneous layers. However, the vacuum frame can save in redrawing—something every bit as important to the small office as to the large. Furthermore, it's much easier to grasp and is thus the ideal introduction to more extensive and complex systems drafting. ■

BRUCE M. COLEMAN *maintains a one-person architectural practice in Syracuse, N.Y., and is on the faculty of the School of Architecture, Syracuse University.*

Specifications: CSI Three-part format

After the introduction of its 16-division format for construction specifications in 1963, the Construction Specifications Institute moved on to the lower levels of spec organization. Standard section numbers and titles were a logical outgrowth of the 16 divisions and, in 1975, CSI first published a standard section format. That was followed by CSI recommendations for page layout and a paragraph numbering system which are relatively inefficient in use of space and for changes in numbering, even with word processors.

The section format, however, is useful and was developed to encourage consistency of location for common types of information within all specification sections in a project manual. Perhaps because the framework was so helpful to the specifier and beneficial to the estimator and contractor, it was quickly adopted. Its incorporation into major master texts (such as MasterSpec and Spectext) and joint publication with Construction Specifications Canada were also factors in its widespread acceptance. Most offices seem to be using it now.

The format is simple. There are three major headings: Part 1—General, Part 2—Products, and Part 3—Execution. Regardless of the type or subject of a specification section, all pertinent information falls easily into one of the three categories. It works as well for performance specs as for descriptive specs, for everything from access doors to air-handling systems.

CSI Document MP-2-2 describes the standard section format and recommends standard article titles (and their sequence) when they are applicable to the spec section and the particular project. The titles are illustrated in the chart on p. 72. The document also discusses subject matter to be included under each topic in detail.

"Part 1—General" is intended to describe general requirements that are unique to a section and would not be found in Division 1. For example, it stipulates type and size of specific samples but not how they are to be submitted. Requirements for delivery, storage, and handling of specified materials supplement the general provisions in Division 1. A detailed list of titles, document numbers, and sources of reference standards in Part 1 allows abbreviated titles to be used elsewhere in the section ("ANSI A 108.1" or "ACI Manual of Concrete Practice"). Part 1 includes those helpful cross references to related work in other sections.

When the work described in a section is to be governed by overall system requirements instead of (or in addition to) individual product or material specifications, Part 1 is the place for them. A curtain-wall fabricator, for example, may be required to comply with applicable code requirements, design constraints (points of support, module size, finishes), performance criteria (allowable air and water infiltration under certain test conditions, accommodation of structural and thermal movement), and acceptable erection tolerances. The requirements pertain to the entire system.

"Part 2—Products" describes materials for the work and their preparation prior to actual installation. Trade names for products (not on the drawings, please), their manufacturers, reference standards for generic materials, fabrication requirements, and model numbers belong in Part 2. A broad article title, such as "Fabrication," may be expanded to "Fabrication of Steel Doors" and "Fabrication of Steel Frames."

"Part 3—Execution" relates directly to the products and materials specified in Part 2. The format suggests three similar titles ("Installation," "Application," and "Erection") that describe what to do with any Part 2 item. Again, a broad article title can be narrowed to "Installation of Steel Doors," etc. In addition, Part 3 includes site preparation requirements (field measurements, priming, protection of adjacent surfaces), field quality control (inspection and testing), adjusting of equipment, and cleaning. The "Schedules" listed in Part 3 are intended to explain where to put what, such as finish hardware and kitchen equipment schedules. They are often located on the drawings instead. Use your own judgment.

The three-part section format works effectively for Divisions 2–16 of the CSI format, with a few exceptions. For instance, a demolition spec seldom lists any products. Instead, it should include the Part 2 title followed by "Not applicable" or a similar statement. When installation of a product is specified in another section, Part 3 could include a reference to that section. The format for Division 1 sections is another exception. Since their

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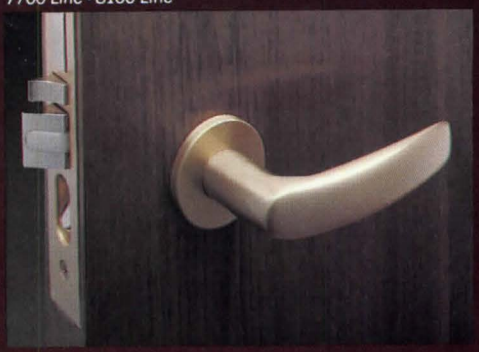

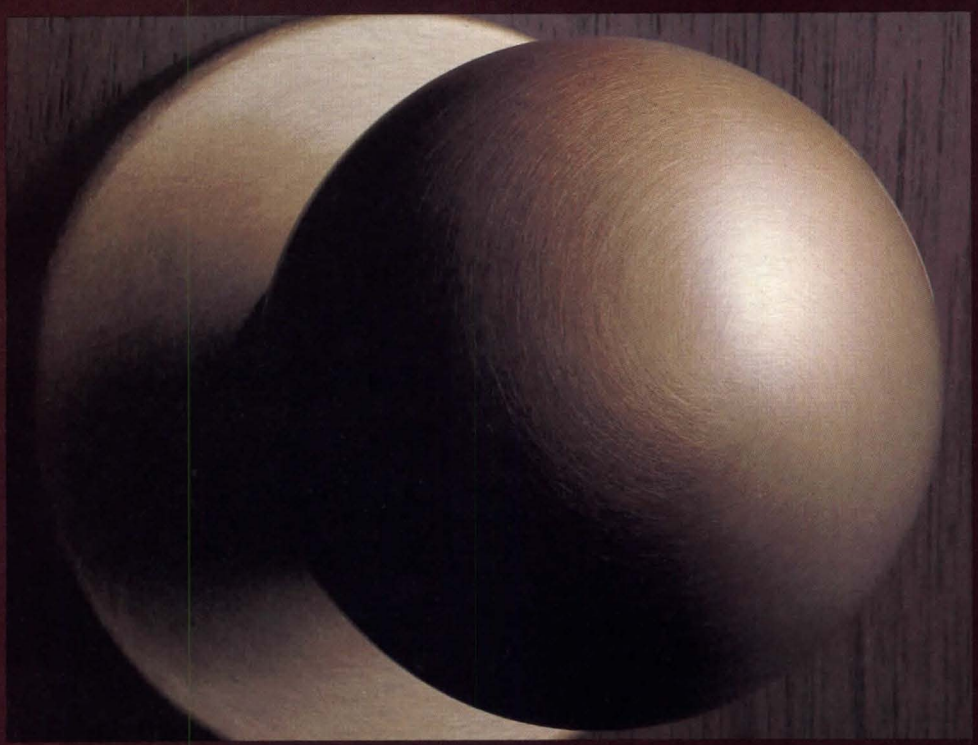

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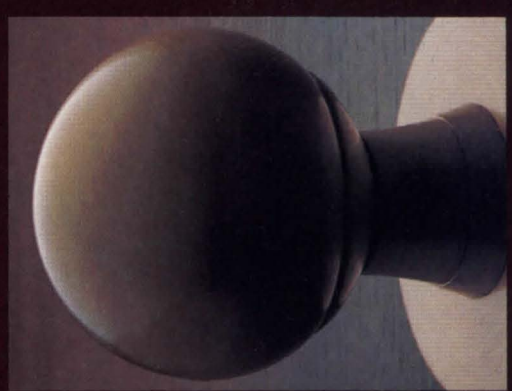

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CSI THREE-PART SECTION FORMAT

Part 1—General	Part 2—Products	Part 3—Execution
Work Included (Optional)	Acceptable Manufacturers	Inspection
Related Work	Materials	Preparation
System Description	Equipment	Installation/Application/ Erection
Quality Assurance	Mixes	Field Quality Control
References	Fabrication	Adjusting and Cleaning
Submittals		Protection
Delivery, Storage, and Handling		Extra Stock/Spare Parts
Project/Site Conditions		Schedules
Sequencing/Scheduling		
Alternates/Alternatives		
Allowances		
Unit Prices		
Warranties		

content is primarily procedural, most specifiers use only Part 1, with or without the Part 2 and Part 3 titles.

The big hassle for specifiers who have not used the CSI section format is the initial conversion of their specifications. It does take time to reorganize paragraphs and change titles, particularly when the work must be done for all sections simultaneously. Continuity in the manual for a project is important. Firms using master specs have an advantage. Once the master text has been revised, all project specs will fall in line. Word processing equipment will expedite the shift, too. It is worth the effort. ■

WILLIAM T. LOHMANN, *AIA, FCSI, is Specifications Manager for Murphy/Jahn, Chicago.*

New wrinkles in retiring

Most employees in private architectural practice have no company-sponsored retirement plan except Social Security. Yet, as doomsday for the Social Security system rapidly approaches, the government wants to encourage private business to install some kind of company retirement plan to subsidize the lesser amount from Social Security that most of us will receive.

To entice management into installing retirement plans, the government has developed some new plans, one of which is mighty tempting to architects. It is known as the 401k plan, after the pertinent section in the Revenue Code. The 401k has three features that make it attractive for an architectural practice:

1 No contribution from the boss is required. Owners of architectural practices often hesitate to install pension plans (more technically known as defined benefit plans) that require annual funding, regardless of the current state of the business. Most practices have a bad year every now and then, and the obligation to fund a pension plan can sink a small practice.

2 The amount that can be put aside for retirement for all employees, including the boss, can be quite substantial, much more than the limitation of 15 percent of the annual salary present in some of the older retirement plans.

3 If a person really needs the money in the 401k account and can convince a committee of fellow employees that it is a good reason (buying a house, paying educational expense, repairing a car required for transportation to work, and payment of medical bills are examples of good reasons), then the money can be withdrawn with no penalty. If a person withdraws funds from an IRA account, a 10 percent penalty is charged. Taxes that have been avoided are due from either account, however, during the year of withdrawal.

The 401k plan resembles an IRA in other respects besides the obligation to pay taxes for early withdrawal. The money that funds the 401k plan, for the most part, comes from the employee's paycheck. The employee elects to save a portion of his or her salary

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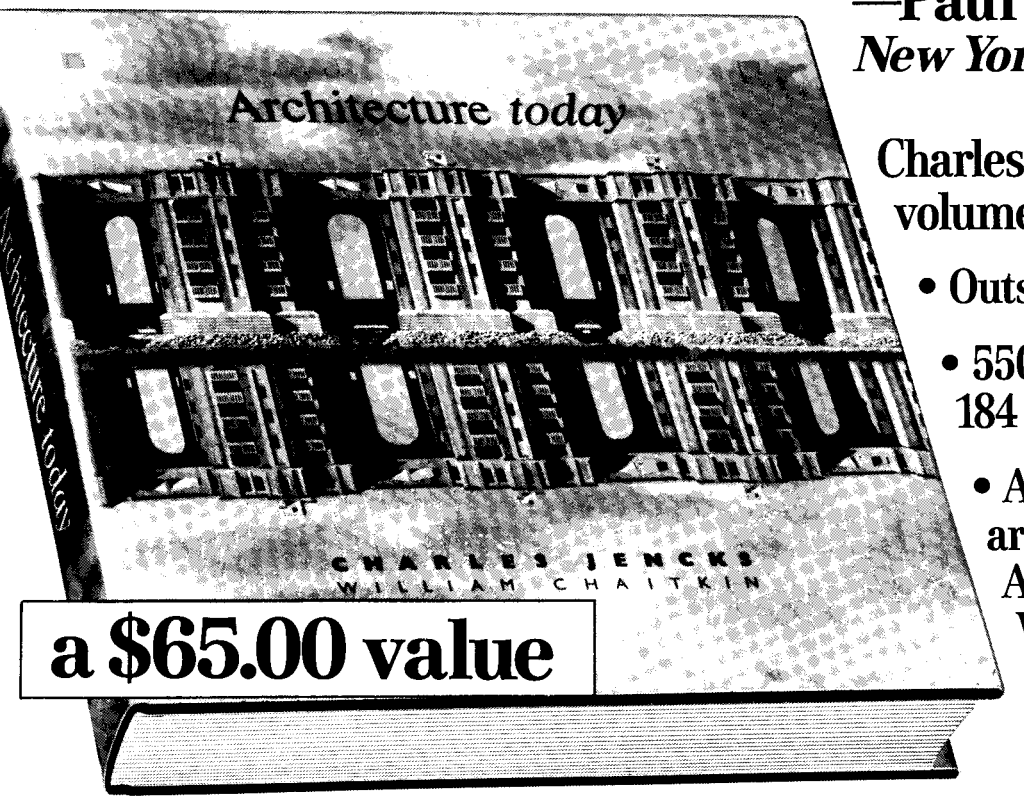

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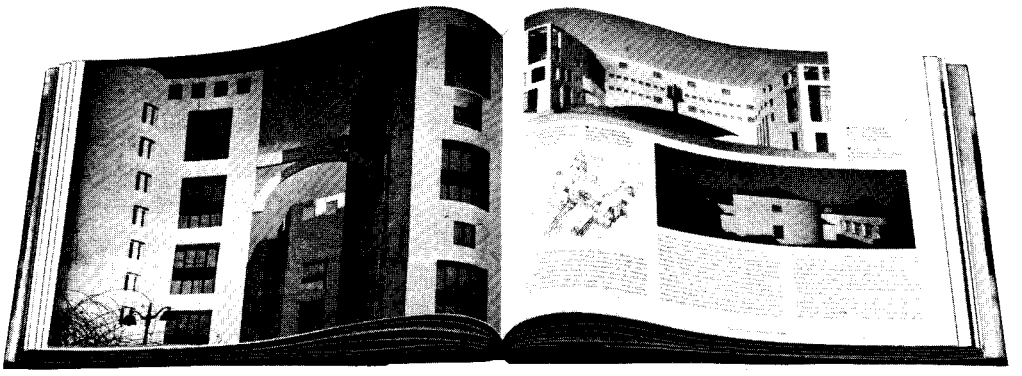

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each payday, and the amount saved is deducted before taxes are calculated on the remainder. Thus, the amount saved and the interest on the savings enter the employee's 401k account untaxed. This avoidance of current taxes allows the same snowballing of savings that permits IRA accounts to grow so quickly. Because the employee actually receives a reduced salary, another name for these 401k plans is OSRP, or Optional Salary Reduction Plan.

The people who invented the rules for OSRP were very clever. They knew that the people who probably would not elect to save for their own retirement were the very ones who ought to: those younger, lower paid staff members who need every cent to live on. They also knew that the people who would benefit the most financially would be the older, higher paid owners and employees who have few other legitimate tax avoidance schemes this good. So the designers of the plan included the rule that a reasonable ratio of savings had to exist between the higher and lower salaried staff members. A common way to assure this "reasonableness" is to state in your plan that the total weekly savings of the top third highest paid staff members won't exceed by more than 2½ times the total weekly savings of the lower paid two thirds of the staff. (List all employees by descending order of salary, draw a line under one third of the names down from the top to determine who is in each group.)

The firm's owners will want to encourage all staff members to participate in the plan, so that the higher paid employees can shelter substantial sums. Some bosses even "bribe" employees to join by matching a portion of the employee's savings with a contribution from the firm, usually in the order of 3 to 5 percent of the person's salary, for those who take full advantage of the matching offer. Of course, the matching contribution must be offered to all employees, high paid and low paid alike. The matching funds are a tax-deductible business expense, just like paychecks.

A pleasurable experience awaits the person who decides to install a 401k plan. The IRS will cooperate with any employer who wishes to install any retirement plan and do everything possible to assist employers in receiving quick approval. In the old days, making a submittal to the IRS for their approval (granting qualified tax status) of a retirement plan was like putting a message in a bottle and throwing it into the ocean. Now it's possible to get IRS approval for a 401k plan within a week or two, and if there is a problem with the text that you submit, some IRS employee who calls you "Sir" will come by your office and help you with the language, if you wish. *Le roi le veut.* ■

C.M. McREYNOLDS *is a human resources consultant from Sierra Madre, Calif., and was formerly Vice President of Human Resources with Welton Becket Associates.*

PSMJ Financial Survey

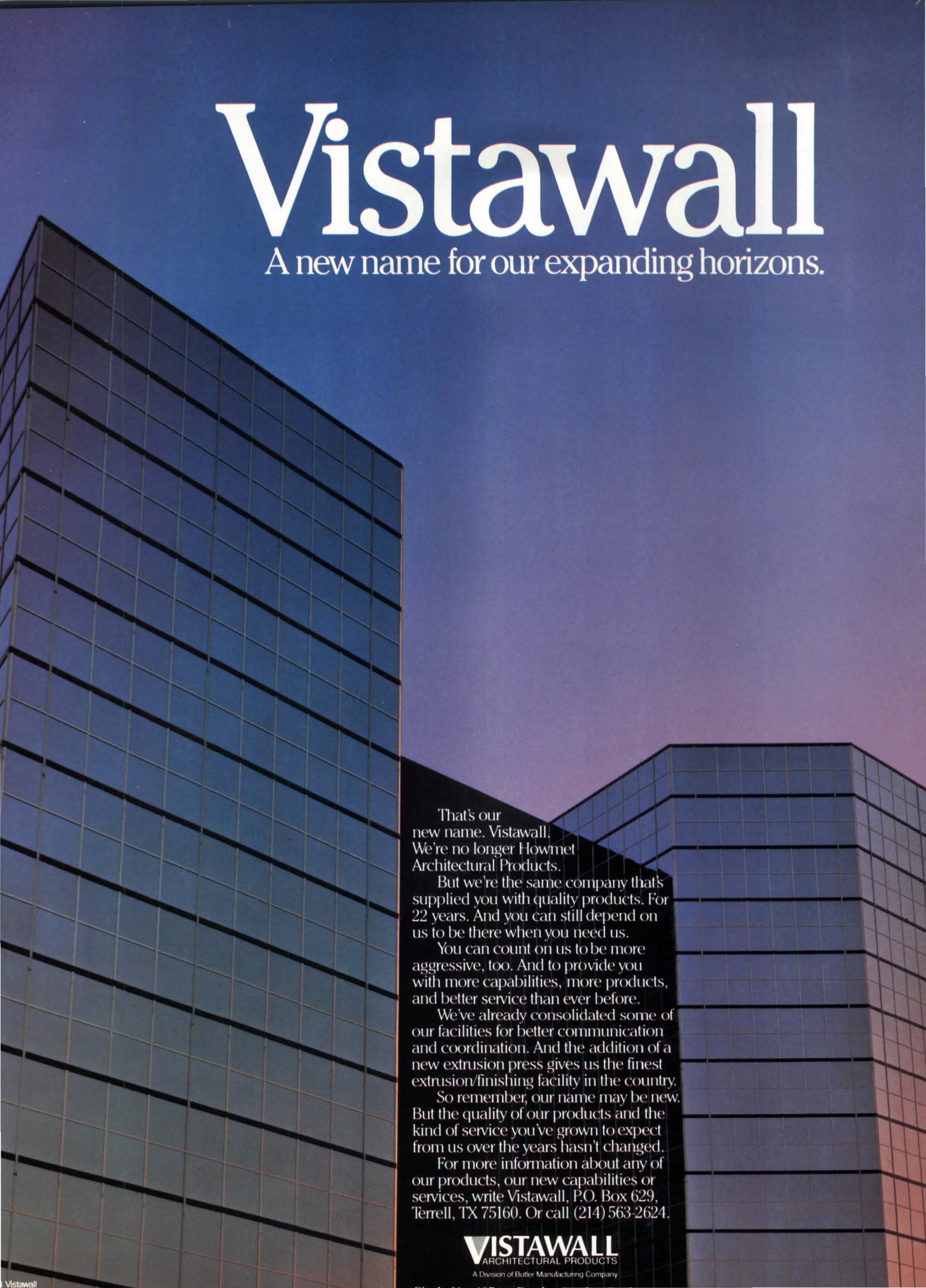
The recently issued 1984 PSMJ Financial Statistical Survey contains a wealth of information for design firms. It includes data to measure the profitability and operating characteristics of firms according to several classifications such as staff size, design discipline, area of the country, and mix of private and public clients. Several significant findings emerged from the survey.

Major financial ratios continued their decline from previous years, reflecting the damage done by the recession. Median net profit before profit distributions and taxes declined from 7.0 percent in 1982 to 6.02 percent in 1984. Not only is the trend in the wrong direction, but the percentages themselves are low. Overhead rates after profit distributions increased from 155 percent in the 1982 report to 161 percent in 1984, with general and administrative costs increasing significantly. These costs should be budgeted at the beginning of the year and procedures established to monitor actual costs against that budget.

One financial measure that did not decline was the ratio of current assets to current liabilities. The median ratio of current increased from 1.75 in the 1982 survey to 2.22 in 1984. A surprising result of the survey is that firms working primarily for government clients showed a higher pretax profitability and spend a higher proportion of their net revenues on marketing than firms working primarily in the private sector. Firms with CADD equipment appear to have higher profits than firms that do not, while firms that have employee stock ownership plans reported lower staff turnover but also lower profitability.

For more information on the survey, please contact PSMJ, 126 Harvard St., Brookline, Mass. 02146 (617) 731-1912. ■

LOWELL GETZ, *CPA, is a management consultant in Houston, Texas.*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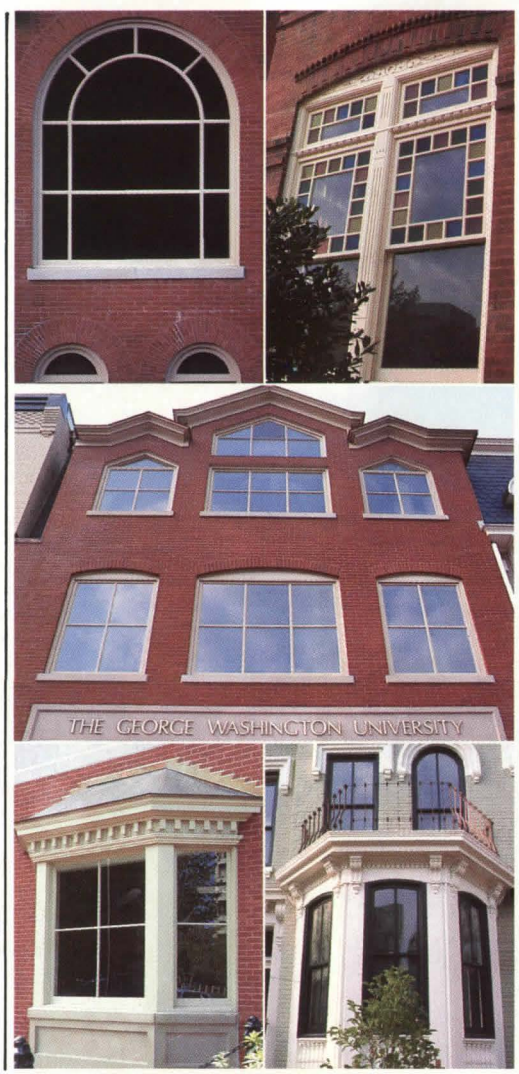

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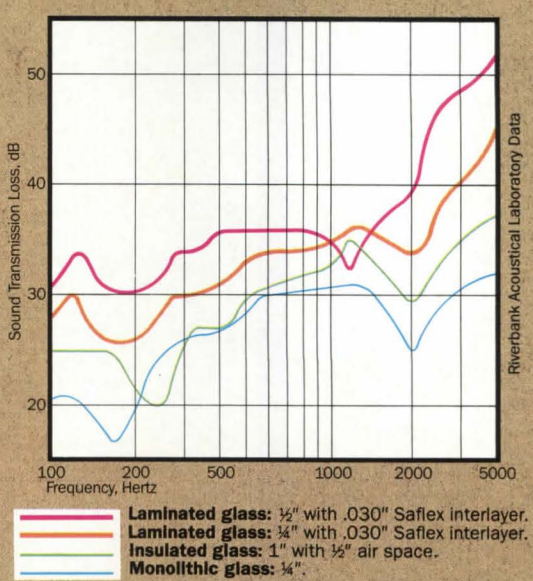

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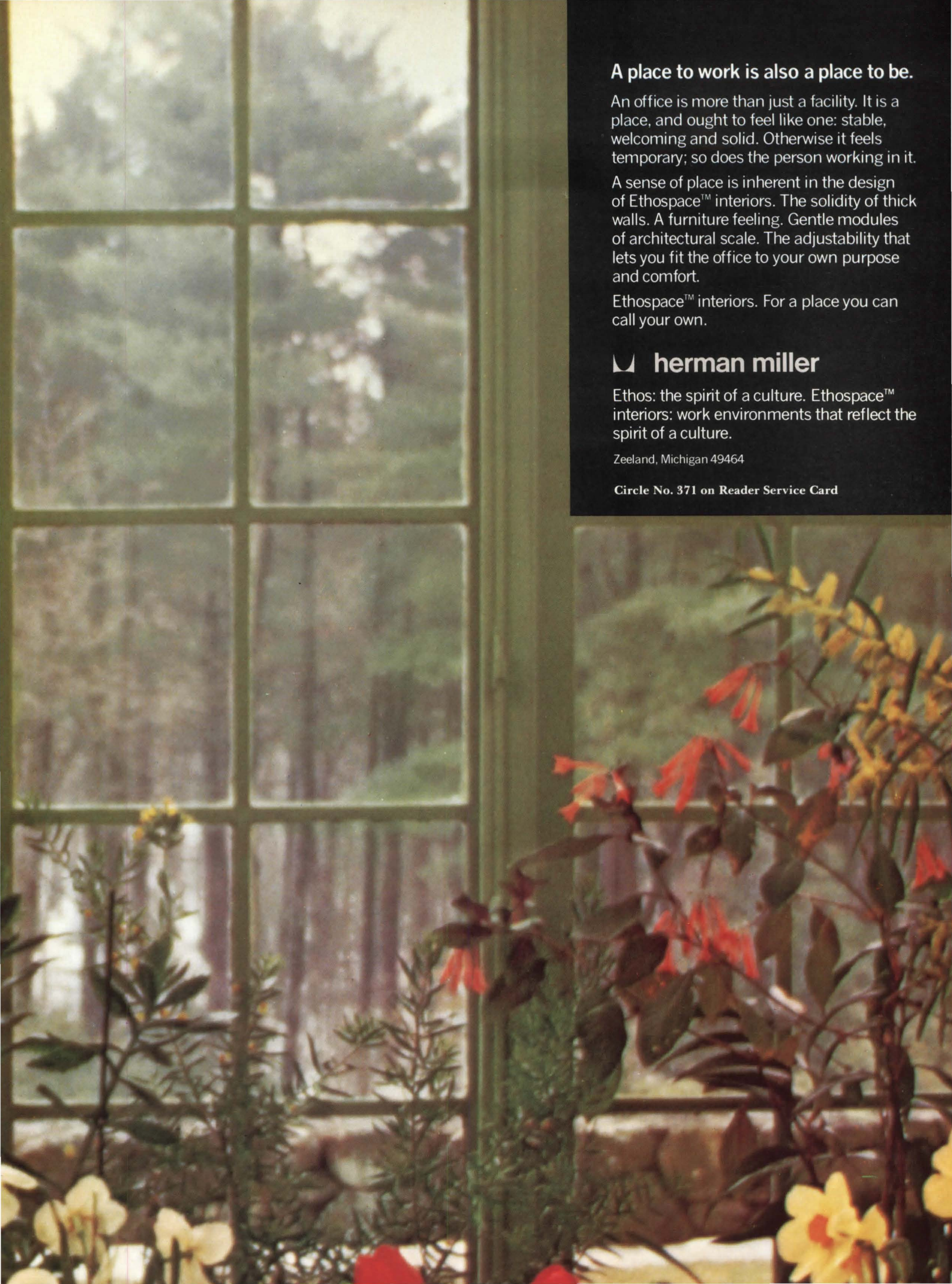

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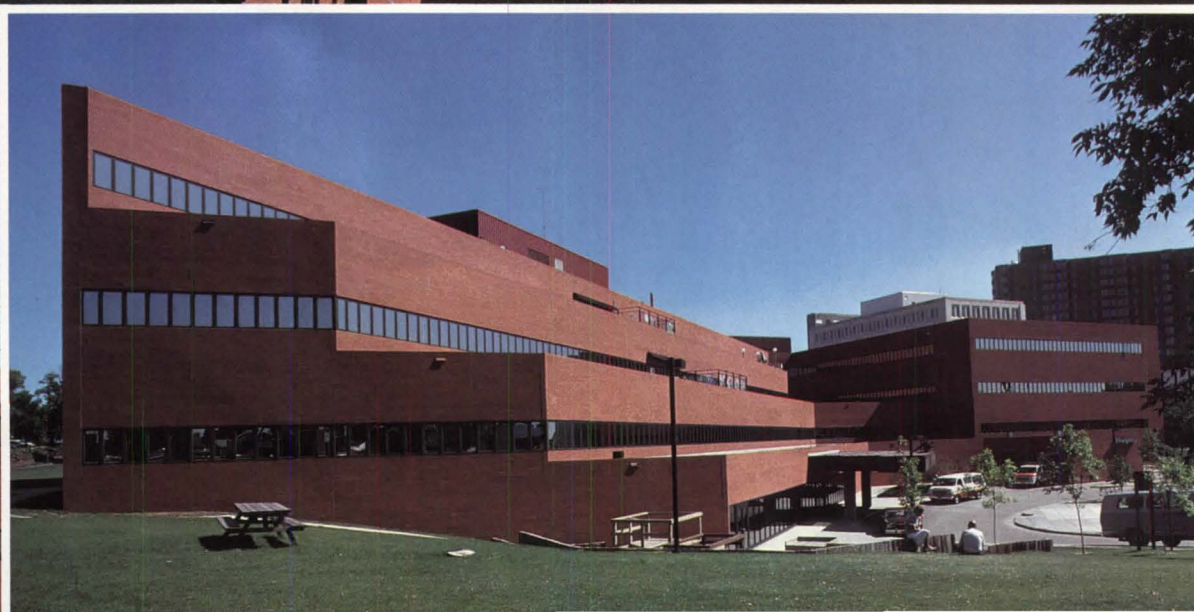

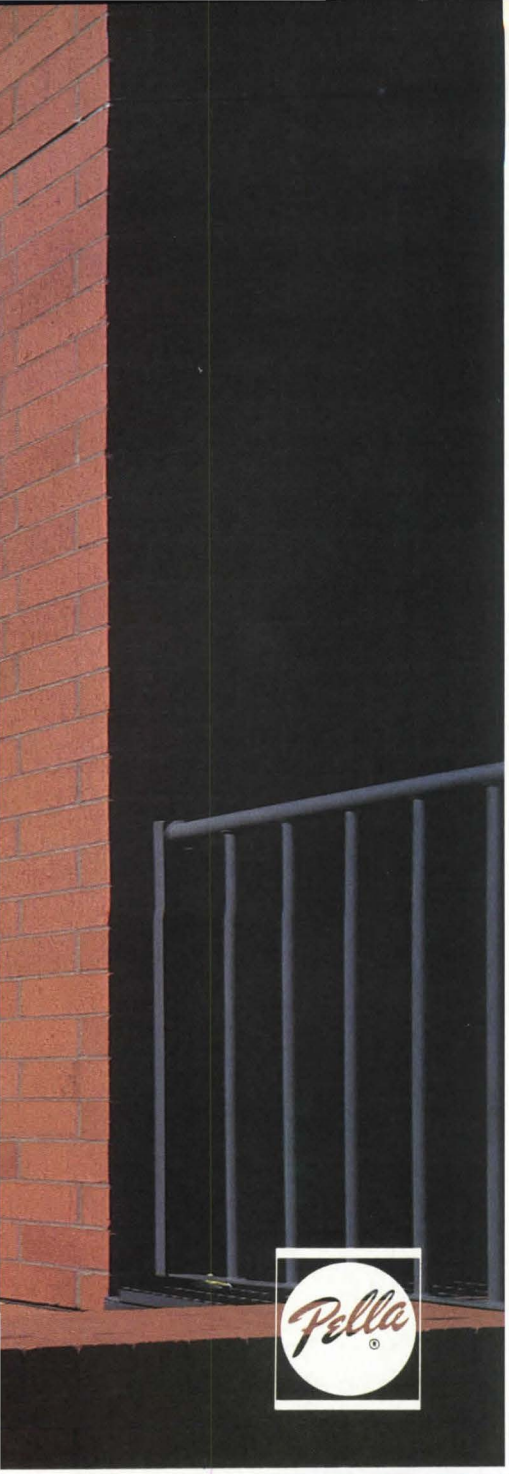

Partition walls may change to meet new needs.

A continuous band of Pella Clad Windows insures that new rooms won't be left in the dark.

Few buildings are as complex as health care facilities. Not only must they meet today's functional requirements as efficiently as possible, but ideally they should be able to adapt to new procedures in health care delivery. This need for versatility is especially true in ancillary services, and here at United and Children's Hospital, long, almost continuous bands of Pella Clad Windows assure that changes in partition walls will create new rooms that still meet code requirements for light and ventilation.

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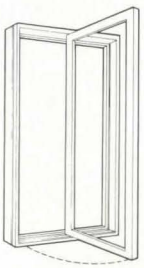

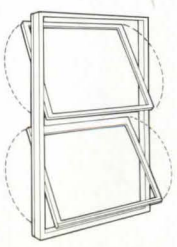

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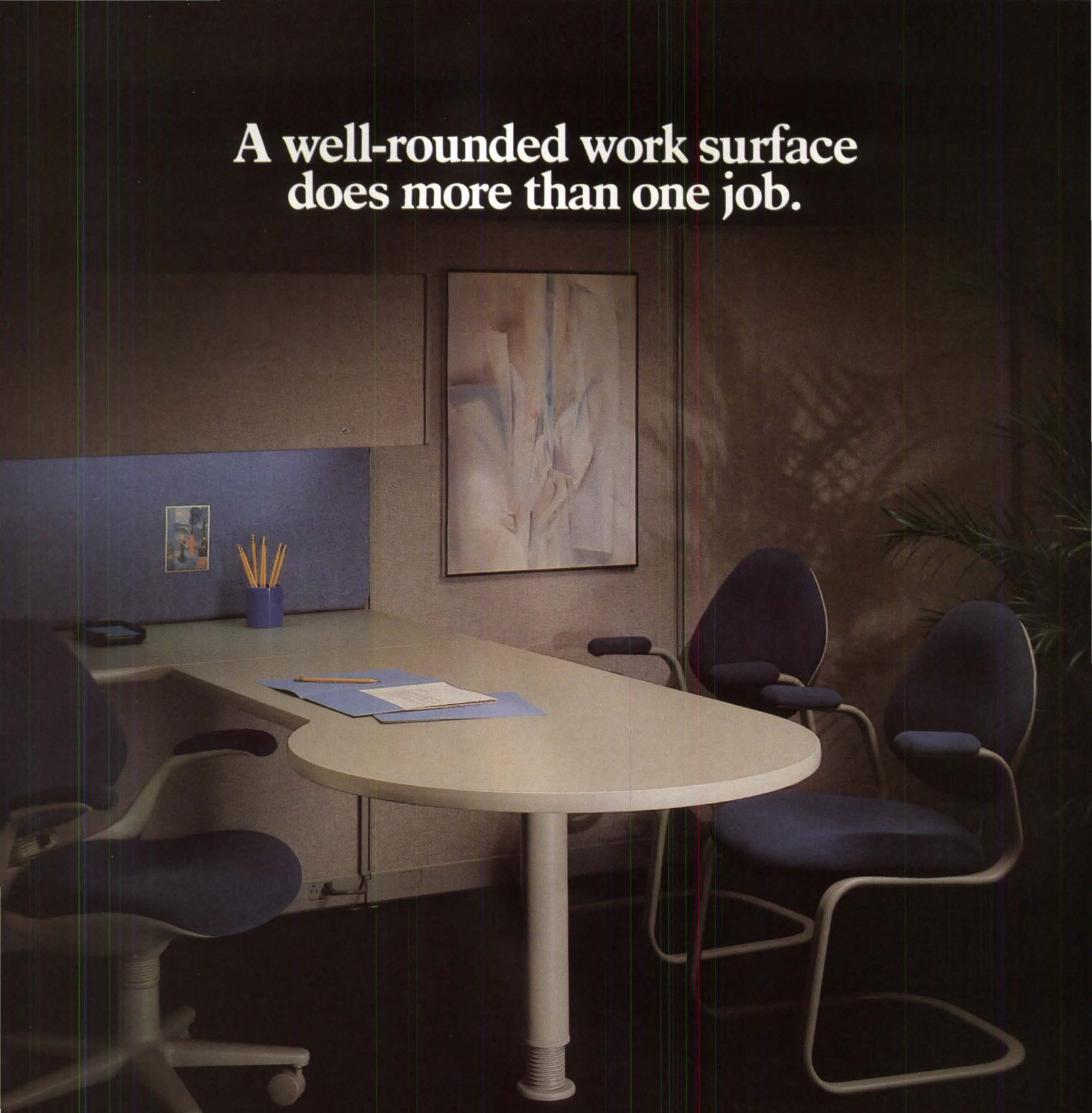

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Rethinking Ruskin

Travelers who chose to take advantage of an exceptionally strong American dollar this summer and fall found the "wonders of the world" under wraps. Big Ben and Westminster Abbey, the Louvre, the Last Supper, and the entire city of Rome—or so it seems—all are cloaked in the rude costume of scaffolding and green gauze that has come to signal repairs underway, while the seven major monuments profiled in these pages have only recently emerged from their wrappers. This phenomenon is not limited to Western wonders: The guardians of China's Great Wall have begun to replace pilfered stones, while Japan struggles to save its most noted natural landmark, Mt. Fuji, from splitting in two.

The sheer volume and rapidity of restoration work underway world wide is enough to give pause. Speakers and attendees alike at the fall conference of the Association for Preservation Technology voiced a common concern that in the present rush to restore, the proper questions might never be asked—questions as basic as whether or not intervention, even for the purposes of preservation, is either necessary or desirable. (For a review of the conference, see page 43.) Searching for philosophical guidelines, these preservationists looked to the great debate of the 19th Century between the so-called Scrapers and Anti-Scrapers. Then, as now, examples of excessively restored or "scraped" buildings provoked a fierce reaction in favor of more limited, moderate efforts. John Ruskin, to whom is attributed the motto "protect, not perfect," is the patron saint of latter-day Anti-Scrapers, and William Morris's famous letter to the *Athenaeum*, in which he issued a "protest against all 'restoration' that means more than keeping out wind and weather," provides the text for a new temperance. This cautionary attitude proclaims: Don't do more than is absolutely necessary to secure a structure's survival; avoid irreversible change; make 20th-Century interventions and additions self-evident; and where documentation doesn't exist, don't fake it.

The seven major monuments shown in this issue are but a fraction of the preservation efforts underway around the world. Not surprisingly, the international rush to restore has provoked debate.

The examples chosen for P/A's preservation issue show this consensus put into practice. A concern for authenticity led the restorers of Trajan's Column and the Arch of Constantine to produce not "seamless," but visibly seamed connections between old and new parts. Carlo Scarpa's renovation of the Ca' d'Oro, necessary for its conversion from private palace to public museum, is distinct from, yet in harmony with, the 15th-Century structure. The Eiffel Tower and Pont des Arts, landmarks of early iron construction, have been fundamentally rebuilt to accommodate current safety standards and expected tourist use. Sullivan's Guaranty Building, a monument in the history of early Modern architecture, has been restored using handcrafted terra cotta techniques, while the Temple of Borobudur in Indonesia required a "high-tech" intervention to prevent its otherwise inevitable collapse.

These world-class monuments may seem far removed from most everyday preservation practice, but the issues they address are crucial ones for the profession at large. William Morris himself first spoke out when an English abbey was threatened by that inveterate scraper Sir George Gilbert Scott, who proposed to restore it to its original, "perfect" state, removing subsequent alterations and thereby erasing the record of time. The episode and its aftermath (Scott lost) constitute a contemporary fable for preservationists debating the ethics of their practice, while the writings of John Ruskin are once again explored and exploited. [DARALICE D. BOLES] ■

In the Empire State

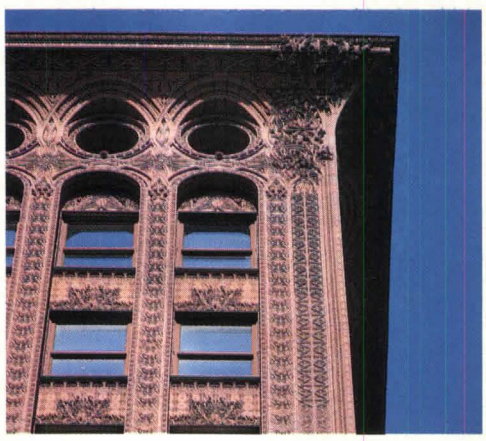
"Discreet inquiries have been made by owners of Louis Sullivan's Prudential Building (formerly Guaranty) in Buffalo, N.Y., about steps to demolish a historic landmark," began an item in the P/A News Report of June 1977. Demolition! Of one of the pioneering works—both technically and formally—of early skyscraper design! Of a structure considered by many to be Sullivan's best skyscraper, four-square and pragmatic, yet enriched with some of his and George Elmslie's finest terra cotta ornamentation! Of a work so representative of the new world of architecture that it has graced for decades the book jacket of Henry-Russell Hitchcock's *Architecture, 19th and 20th Century!*

Adler and Sullivan's 1895 Guaranty Building is restored with sense and sensibility by Cannon of Buffalo.

But there stood the Guaranty in 1977, despite its National Historic Landmark status vacant, partially damaged by fire, marred by insensitive alterations, and losing money for its owners who had acquired it when foreclosure was imminent. This time, however, the city that had witnessed the destruction of Frank Lloyd Wright's Larkin Building a generation earlier rallied to save its landmark.

In September of 1977, the Greater Buffalo Development Foundation established a volunteer task force of business and community leaders to study the feasibility of preserving the Guaranty, designed in 1895 by Adler & Sullivan of Chicago. They concluded that there was, in fact, a need for first-class office space in Buffalo, so that the design and location of the Guaranty warranted top-quality restoration. They recommended infilling the U-shaped plan's light court (orginally incorporated to supplement the inadequate electric lighting of the 1890s) in order to increase the area and flexibility of the rental space. They proposed the complete replacement of the mechanical systems, and the cleaning and restoration of the exterior skin. They sought prospective tenants among governmental and private interests, predicting a strong market among attorneys because of the nearby court building; and they suggested financial strategies that would include a federal UDAG grant towards the capital cost, tax-exempt financing rates, partial property tax abatement, and private loans.

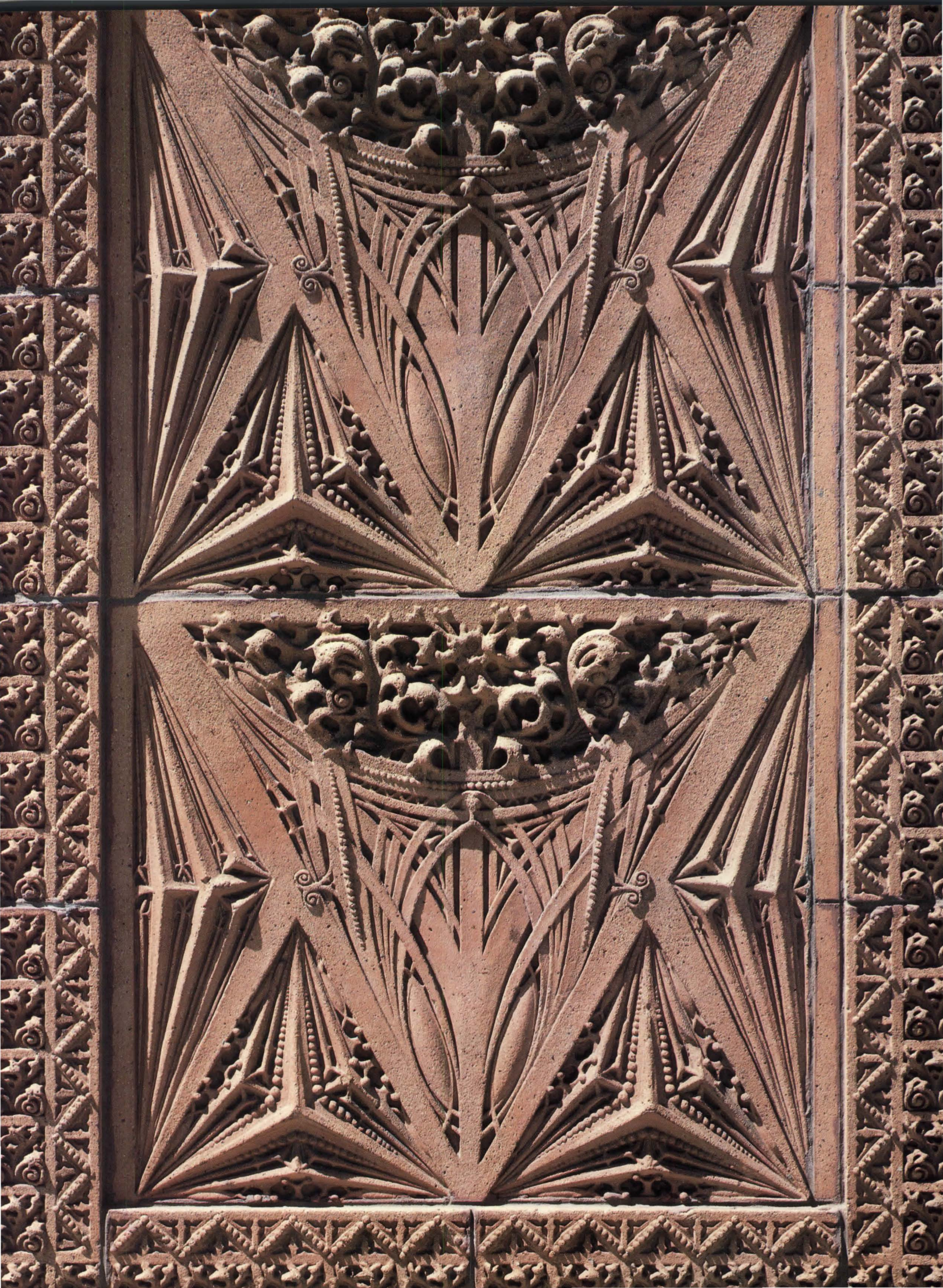
The eventual developers of the building implemented the task force's proposals, hiring the Buffalo architectural/engineering firm Cannon, which had been involved in the original feasibility study, to carry out the restoration. While the $12.4 million required for the project approximately equaled the estimated cost of a comparable new building, according to the developer, the Guaranty's status on the National Register of Historic Places qualified it to receive a 25 percent tax credit on the investment under the Economic Tax Act of 1981.



The terra cotta facing on the two street façades of the Guaranty building (this page and opposite) provided both a fire-proof casing for the building's steel skeleton and a vehicle for the expression of Louis Sullivan's naturalistic philosophy. The terra cotta has been cleaned and, where necessary, repaired or replaced, and the mortar joints raked and painted with a carefully matched color.

The main façades

Philosophically, the treatment of the two ruddy terra cotta façades was relatively simple—to clean and restore them as closely as possible to the original. The upper 11 floors were cleaned with a mild chemical solution, but the lower two floors had been damaged by sandblasting in the 1950s and had to be cleaned very carefully. Throughout, a patina was intentionally left. At these levels, there were sizable numbers of missing and broken terra cotta pieces: The original glass project-

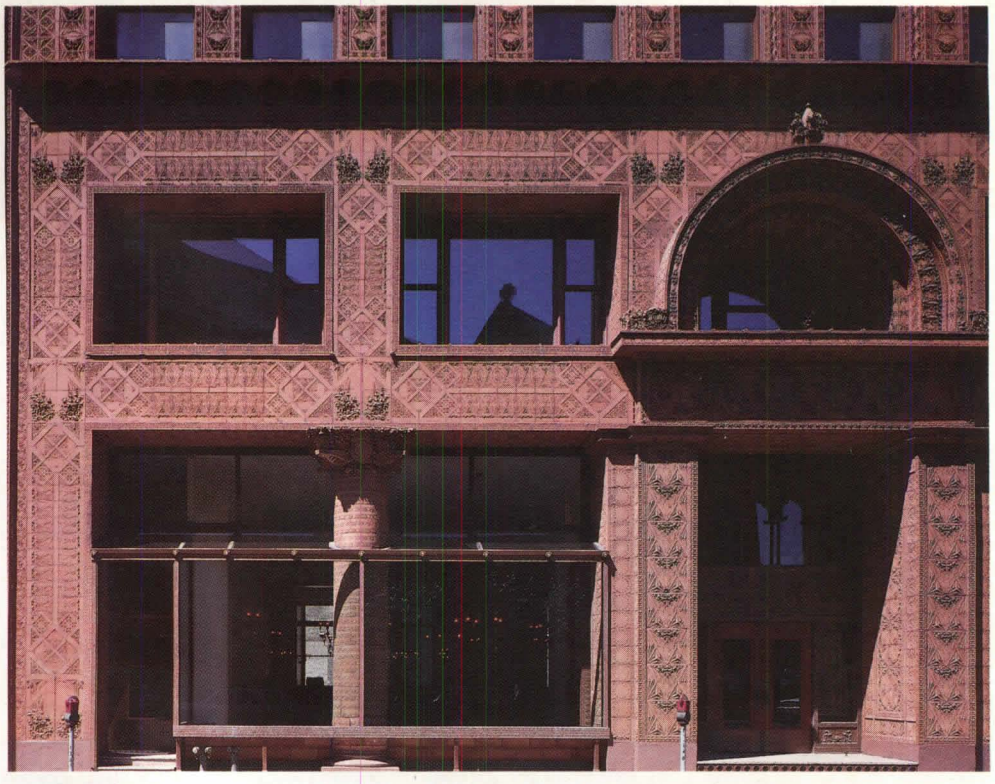


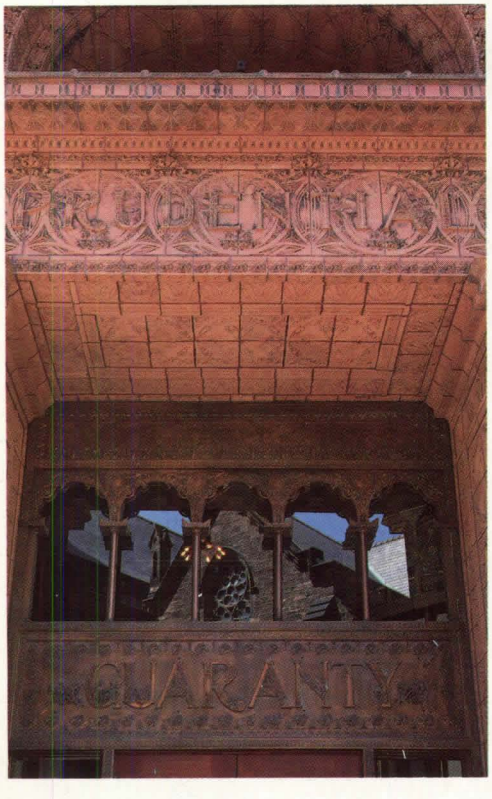
ing storefronts, which had embraced the round columns, had been replaced in the 1950s by modern aluminum and glass walls standing behind the columns, an act which destroyed the inner sides of the capitals.

The original projected storefronts were restored, using new ornamental frames matching the original ones in profile, but unornamented on the interior. Replacement terra cotta pieces were created using photographic details and molds taken from existing parts, and this aspect of the restoration is itself an encouraging story of artisan support. Only four firms in the country were qualified to execute the terra cotta work, and Cannon decided to give the commission to a young firm, Boston Valley Pottery, whose proximity to Buffalo made frequent checking of color and quality possible, and whose owner, artist Andrew Krause, was empathetic with Sullivan's intentions.

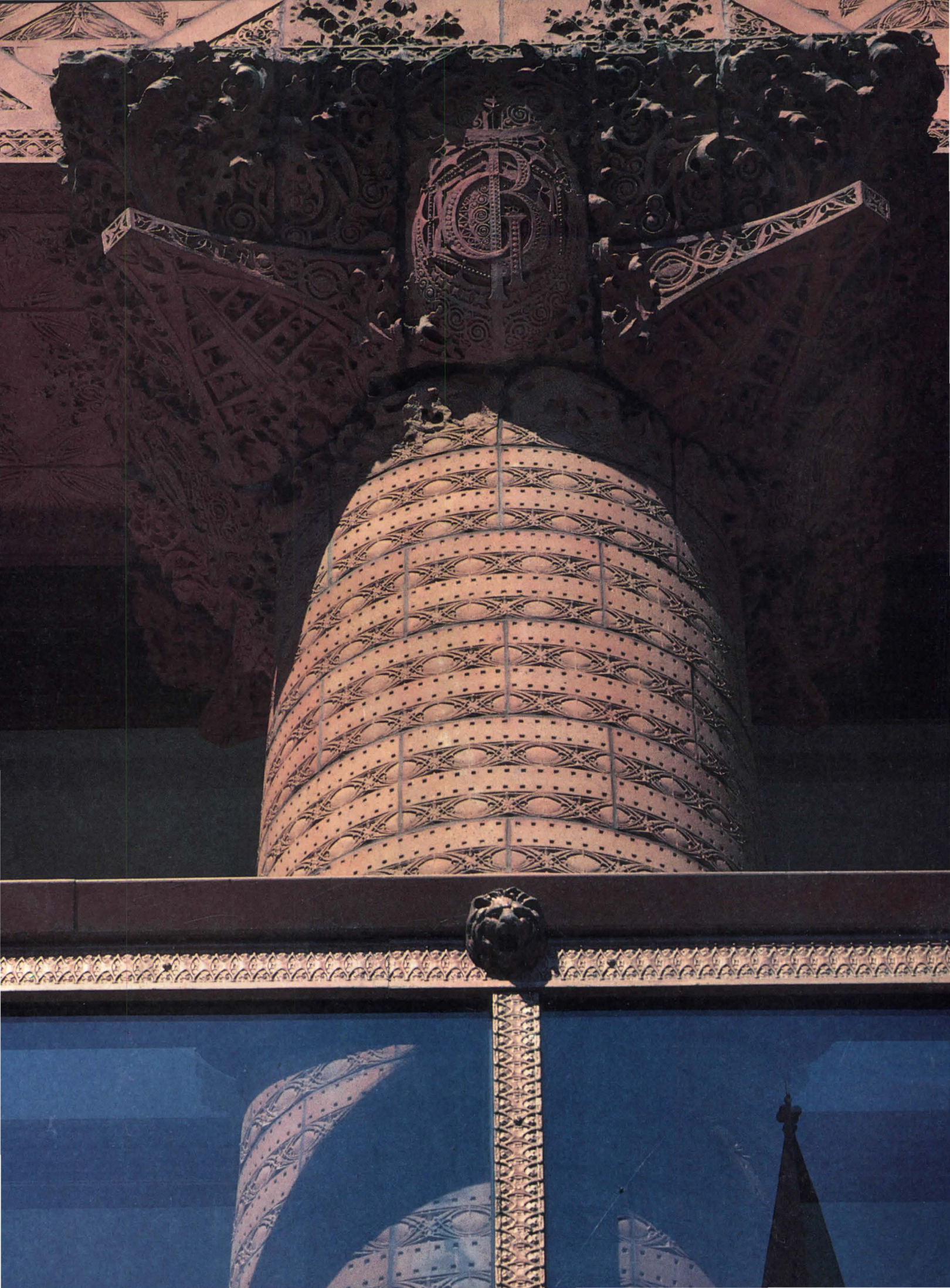
The lobby

Because of fire safety requirements, the original light-filled, open quality of the lobby had been severely compromised: The elevator grillage had been covered over with ceramic tile, the monumental stairway had been enclosed, a suspended ceiling hid the skylighted





The round terra cotta-framed columns are once again embraced by projecting glass storefronts (photos, above and opposite page). The new cast aluminum glazing frames replicate the original in profile and resemble the original in exterior ornamentation, but are unornamented on the interior (left). Within the Richardsonian-inspired entranceways (top), the building's names appear twice (above left): Prudential, its name after 1898, and Guaranty, its original name which had been covered by a plaque, now removed.

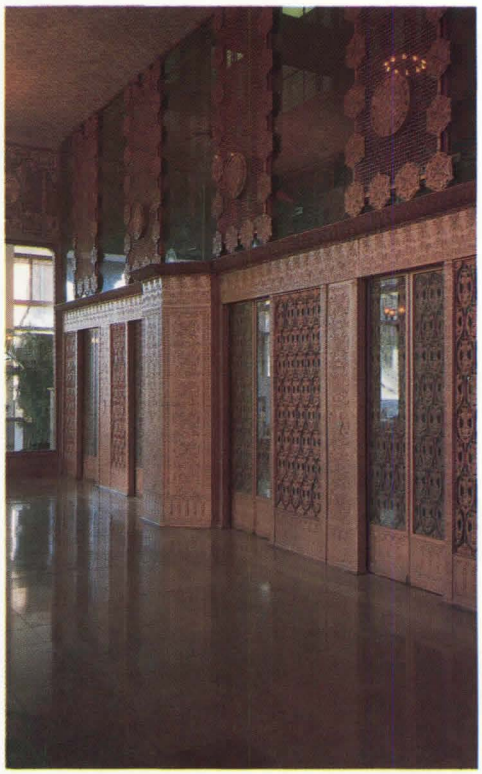


art glass ceilings and part of the mosaic frieze, and opaque material surrounded the glass partitions between retail spaces and lobby. The architects restored the open grillage of the elevator shaft, using a wire-glass lining and a sprinkler system to satisfy fire code requirements. The enclosure around the stair was removed (an alternate means of egress was provided between the second and ground floors while above, the original stair again recedes ignominiously behind fire walls), the circular midpoint landing was restored, and the treads, balusters, and column covers restored as in the original. The bronze electroplated cast-iron parts in the lobby—elevator grillages, stair rails, and interior glass storefront frames—were restored partly by casting new pieces from original ones, and partly by incorporating original pieces that had to be stripped of paint, recoated, and sealed.

The marble mosaic frieze around the lobby, badly scarred by the installation of the hung ceiling, was repaired by an 88-year-old Italian craftsman using marble pieces salvaged from damaged mosaics behind the elevator shafts. The latter mosaics will be recreated eventually using new marble.

The art glass ceilings under the original skylights at the base of the light well, also damaged by the careless suspended ceiling installation, were removed, cleaned, and reinstalled with additional structural support and, where necessary, new pieces of matching glass. Most tricky was the replication of natural light by artificial light, accomplished by indirect daylight spectrum lighting reflecting off the white-painted structural underdeck. Except for the visibility of the fixtures through the ceiling grillwork from some vantage points, the result is quite successful.

Now that glazed walls enclose the retail spaces both inside and out, the original Sullivanesque open feeling is restored. Light sconces and hanging fixtures match original



The airiness of the original lobby has been reinstated by the exposure and restoration of the original monumental staircase, elevator grillage, and backlighted (originally skylighted) art glass ceiling (above and opposite page), as well as the use, once again, of glass partitions around the flanking retail spaces. Lighting fixtures match original models, but granite rather than the original mosaic is used for the floors. Sullivan's marble mosaic frieze has been repaired (detail, above center), and the vestibule ceilings restored (above left).

ones discovered in the building, and even the carbon filament bulbs have been reintroduced. While owners and architects retain a certain amount of control over the design of the retail fittings, it is nonetheless jarring to see the computer-age colors and displays of the business equipment shop that is located in the most prominent, corner, position where originally a bank, undoubtedly discreet, had been. Part of an original semicircular stair has been recreated in this space.

Office floors

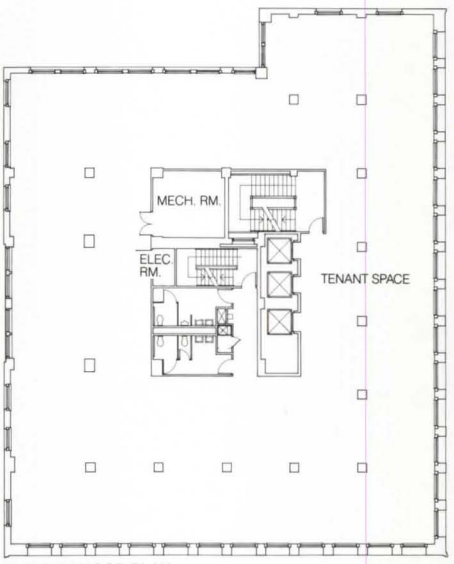
On the upper levels, floors 3 to 13, modern office requirements have been met in standard ways, with a lay-in ceiling, efficient core and corridor, and code and handicapped toilet requirements. The exterior walls have been thickened with additional insulation for energy efficiency. Originally, a modern curtain wall with metal windows was to enclose the infilled court, but it was discovered that reusing the white glazed brick that lined the light well, and incorporating new wood windows, would be cheaper, not to mention philosophically preferable. Similarly, single-hung mahogany sash windows that match the original ones (but with simpler bevels) proved as inexpensive as metal windows throughout the building.

As the Cannon architects tell it, renting a space in the Guaranty resembled joining a men's club. Each office was ensconced behind a wood-paneled, Florentine-glazed front, a restaurant was located in the basement, and on the seventh floor stood a generously proportioned men's lavatory and a barbershop. Facilities for women, who had little business in the building, were limited. The latter facilities now meet modern requirements, but a restaurant designed by DePolo Dunbar has been reestablished in the basement, and the second-floor front offices have been restored with original wood and glass partitions. On this level, at the bottom of the infilled court, the Buffalo Architectural Museum, directed by John Randall, may take up quarters.

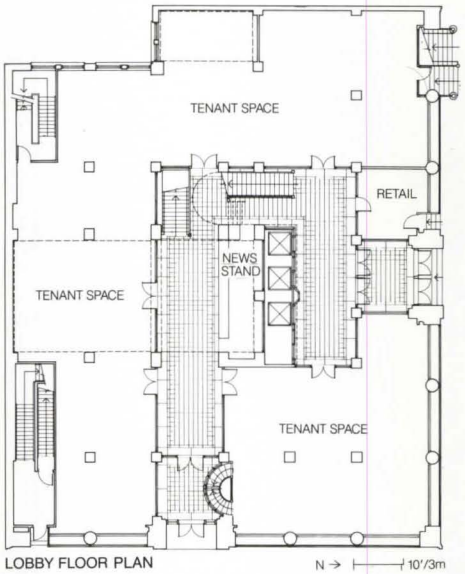
Peter Flynn of Cannon suggests that the restoration success can be judged in two ways: philosophically, as an aggregation of all the different elements; and by an evaluation of the individual restoration specialties. Success according to the second criterion is joyfully evident upon inspection, as the photographs on these pages testify. As to the first criterion, there is no doubt that Sullivan's powerful vision still holds sway.

[SUSAN DOUBILET] ■

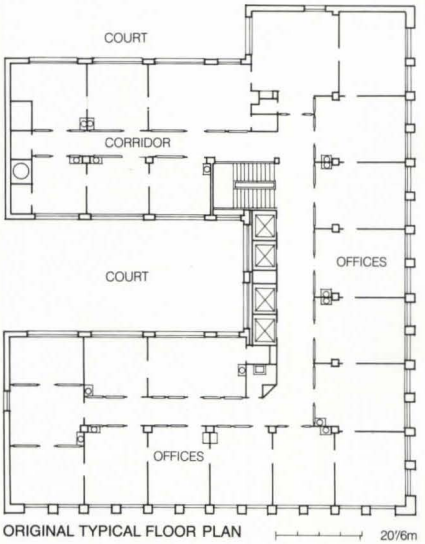
The light well on the building's south side has been filled in, in the interest of additional and more flexible rentable space, and the original white glazed brick that lined the light well has been reused for the infill wall (below).



TYPICAL FLOOR PLAN



LOBBY FLOOR PLAN N → 10'/3m



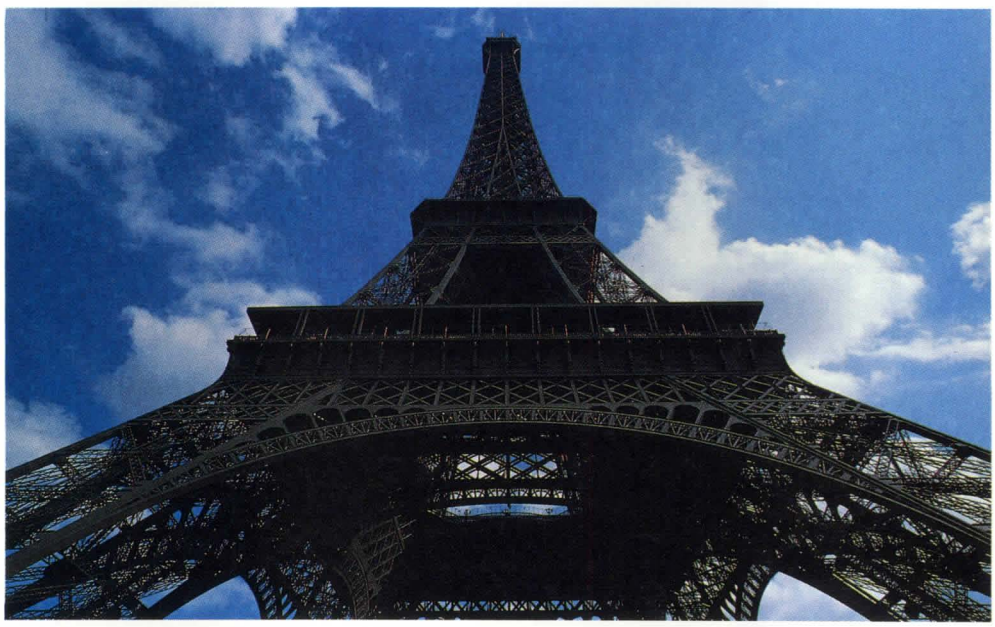
ORIGINAL TYPICAL FLOOR PLAN 20'/6m

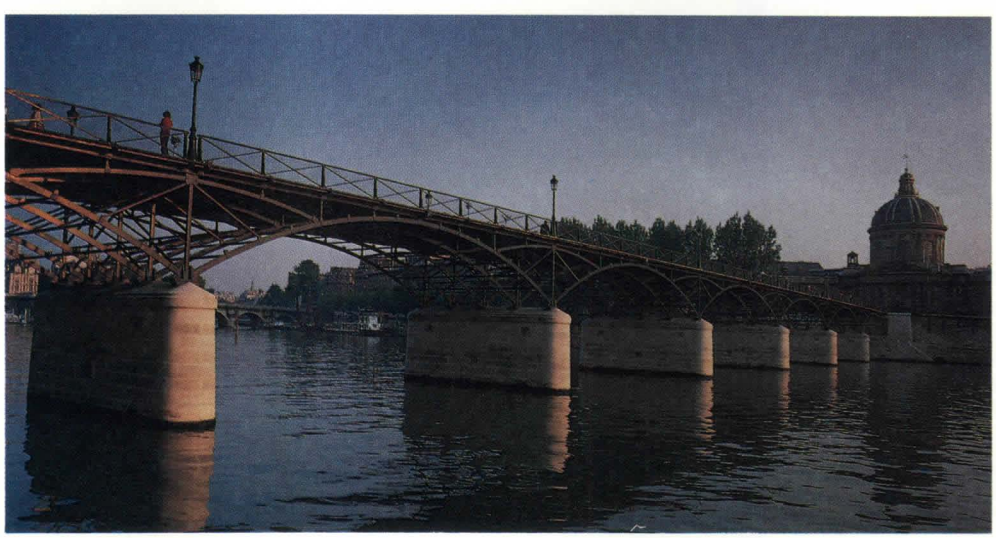
Project: *Guaranty Building (also known as Prudential Building), Buffalo, N.Y.*
Original architects: *Adler & Sullivan, 1895–96.*
Restoration architects: *Cannon, Buffalo, N.Y. (Ronald J. Battaglia, principal; Peter T. Flynn, project architect; Charles Gordon, Joseph Marra, Javier Salazar, William Scott, design team; Alan Sloan, Ronald Parsley, Calvin Puffer, Arthur Kelly, engineering team; Gordon Love, cost administrator).*
Client: *The Jeffersonian Corporation, Cleveland, Ohio.*
Site: *corner site, 113' x 93', in downtown Buffalo.*
Program: *restoration of the exterior, lobby, and second-floor offices. Infill of original lightwell and provision of modern, flexible office space satisfying modern office requirements and code.*
Structural system: *steel frame with flat arch clay tile resting on purlins. Columns made up of composite angles, stitch riveted. Structural system patented in 1892 by James H. Gray of Sullivan's office.*
Mechanical systems: *two gas-fired boilers circulated to perimeter fin tubes, cabinet heaters, and air handling units. Cooling by cooling tower and condenser and six self-contained VAV boxes ducted through ceilings.*
Major materials: *foliate and geometric terra cotta with brick backup on north and east walls; south wall infill, Tiffany "Chicago" glazed brick from light court; steel stud, rigid insulation, and drywall added on floors 3–13. Lobby floor: marble, plaster, ornamental cast iron, plate glass. Second floor: marble wainscot, wood trim, Florentine glass (see Building materials, p. 166).*
Consultants: *interiors, DePolo Dunbar; structural and mechanical, Cannon.*
General contractor: *Balling Construction.*
Costs: *$5.5 million 1983, not including tenant finishes on office floors.*
Photography: *Patricia Layman Bazelon.*

Pont des Arts
Eiffel Tower
Paris, France

On the Seine

The Pont des Arts and the Eiffel Tower, two landmarks of 19th-Century engineering, have been restored using 20th-Century materials and methods.





The reconstructed Eiffel Tower and Pont des Arts maintain the appearance of both beloved monuments, although the underlying structure of each has been fundamentally altered.

The Pont des Arts and the Eiffel Tower bracket the history of 19th-Century iron construction as they do the landscape of the Seine. Once symbols of modernity, both structures have only recently been admitted to the lists of protected monuments (1964 for the tower and 1973 for the bridge). Both posed challenges to the architects and preservationists charged with their restoration, requiring some of the most innovative techniques of metal repair and unleashing an often impassioned debate between conservationists who viewed the structures as urban museum pieces and pragmatists who felt the original spirit of innovation embodied in them should continue to inform their adaptation to late 20th-Century urban life.

Both the bridge and the tower are exceptional in many respects, not the least of which is that these watersheds of utilitarian construction were primarily aesthetic in design and use. The Pont des Arts is in fact a *passerelle,* conceived from the first as a purely pedestrian connection between the Louvre and the Institut de France (then the Palais des Arts). Closed at both ends, where a one sou admission was collected, and dotted with trees, verdant conservatoires, and refreshment booths, the bridge was more a promenade suspended above the Seine "with the lightness of black lace" (Emile Zola) than a simple passage from one side of the Seine to the other. Both technically and programmatically, this panoramic viewing platform is the spiritual forebear of Eiffel's vast bridge-pylon turned tourist attraction. The 300-meter-high tower, built to commemorate the 100th anniversary of the French Revolution at the *Exposition Universelle* of 1889, allowed anyone with a few coins and much courage to ride to the top where he might momentarily control all of the French capital at a glance. The conflict for the 20th-Century guardian, then, pits the adaptation of these privileged pauses in the urban landscape to the crush of today's tourists against the painstaking historic restoration and protection of two early iron monuments, incunabula of Modernism and testaments to France's technological eminence in the last century.

The Pont des Arts

From its construction in 1801–03, the elegant Pont des Arts, conceived by the engineer Louis-Alexandre de Cessart, was the object of vitriolic criticism. Napoleon himself complained that it lacked the solidity of a monumental public structure. His architects Percier and Fontaine found the bridge's delicate style inappropriate for a link between two

Pont des Arts
Eiffel Tower

A barge collided with the Pont des Arts in 1979, causing its partial collapse (right). The reconstruction (facing page) accommodates river traffic with higher and wider arches.

Ville de Paris, Photo Graebling

major stone monuments, and the exceptional height of its pedestrian platform damaging to the proportions of Le Vau's Institut façade; these arguments resurfaced frequently in the controversy over the bridge's reconstruction in the late 1970s. Considerably altered over the years to accommodate changes in the Seine's quais and severely damaged by three successive barge collisions (1961, 1970, 1979), the last of which gave the fatal blow, the bridge was, by the time of its demolition in 1981, reduced to three of its nine original arches. Many argued then for the definitive demolition of the bric-à-brac structure which makeshift repairs had kept open to the public until 1977. The barge pilots' union was in fact one of the most insistent voices pressing for its elimination. Advocates of the bridge's restoration, on the other hand, had to contend with the prohibitive expense of reconstructing the missing cast-iron arches and the near inevitability of future accidents if the arches were not widened.

In 1978 the municipal government confided the reconstruction to architect Louis Arretche. Rejecting a frankly modern, high-arched replacement similar to that built in the 1960s between the Tuileries Gardens and the Quai d'Orsay, the city opted for a reconstruction that restores the profile and character of the original bridge, but accommodates river traffic. While the overall height and width of the new bridge are identical to its model, the rhythm was fundamentally changed by the reduction of its arches to seven. Although the number and composition of the metal members is the same, the structural reality of the bridge has been radically transformed. Rebuilt in anticorrosive steel on piers of reinforced concrete clad in tooled ashlar, each 17-meter span has been replaced by one of 22 meters. The navigable passages have been increased both in width and height, and are now equivalent to those of the adjacent 17th-Century Pont Neuf, Paris's oldest bridge.

The new Pont des Arts commemorates its rigid, fragile Napoleonic predecessor in a bridge that is supple and individually jointed to localize the absorption of shock and accommodate atmospheric and temperature variations. More significantly, the platform—rebuilt in exotic Azobe timbers imported from the Ivory Coast to replace a heavy concrete platform which had replaced the original oak planks—is now able to slide independently of the arches and will not be imperiled if one of the arches is struck. The concrete piers are clad in an ashlar carefully selected from the same quarry as that which supplied the restoration of Notre Dame and La Sainte Chapelle. In the radical tradition of French restoration since Viollet-le-Duc, the idea of the monument has been preserved even if its remaining fragments can be admired only in the nearby Musée d'Orsay.

The Eiffel Tower

Immediately after the World's Fair of 1889 closed its doors, Gustave Eiffel realized that the only way to save his great monument would be to find new and profitable uses for the iron dinosaur. Eiffel himself thus supervised the first changes made in the tower to accommodate a meterological station (1890), a military telegraph station (1903), and a laboratory for studying aerodynamics (1909), a chief factor in the original design. The tower was considerably modified for the expositions of 1900, 1925, and 1937, particularly on the spacious first platform level where Eiffel's filigree scalloped "balustrades" gave way in 1937 to the strong, horizontal, "modern" profile we know today. Expropriated by the German and then the American armies during World War II, the tower has been adapted in recent years to suit its present role as a television antenna. In 1980 when the agreement between the city of Paris and the tower's administrators expired, a new society (La Societé Nouvelle d'Exploitation de la Tour Eiffel) was organized and charged with drawing up and directing a thoroughgoing restoration.

The program required not only a complete check of the tower's metallic structure from its principal girders to its most *fin-de-siècle* filigree tie rods, but also the reorganization of its elevators and tourist facilities to accommodate a projected influx of 5 million visitors annually. Restoration begun in spring 1981 was completed at the end of 1983 at the cost of 205 million francs under the direction of the architect M. Duhard. Work concentrated on two areas in particular: the two decks of the first floor platform and the core of the central needle, or shaft, where the original elevator and stairs leading to the summit were replaced. Both phases involved the simultaneous stripping away of latterday accretions and addition of modern services without obstructing that remarkable transparency which is the tower's trademark.

The first terrace was drastically lightened by the replacement of its heavy concrete floor (installed in 1936) with the most advanced lightweight concretes and plastics and by the demolition of a century's "parasite" constructions which exceeded Eiffel's allowable loads by some 1120 tons, leading to alarming deformation of the principal circumferential girders. In addition, x-ray studies of the iron members revealed numerous weaknesses in the flange structure, attributed to faulty loading profiles in the original design. Iron members were therefore trimmed, replaced, or reinforced by huge steel "clamps," which diminish the load on the beams' sections. Three new pavilions of identical lightweight metal and smoked glass construction house historical exhibitions, cinemas, snack stands, and lucrative multipurpose rental space. Architect Duhard set out to evoke both the transparency and the curved elegance of Eiffel's tower in these sleek new additions. Ironically their "contextualism" is a modern-day discretion: In 1889 this terrace hosted a neo-Moorish village of restaurants and shops, which offered an arresting contrast to the industrial filigree of the fair.

The redesign of the upper levels of the tower posed an entirely different set of problems, centered on the installation of a remarkable new set of elevators by Otis. (Studies for replacing the complicated, variably inclined lower elevators, originally installed by Otis and used continuously since the Fair, are now underway, pending city funding.) The uppermost story was served until 1982 by a series of two hydraulic elevators installed in 1897 by the engineer Léon Edoux. Although historic monuments in their own right, these elevators no longer met peak tourist demand nor did they comply with current safety codes. (The elevators were closed of necessity in winter when the water in the 80-meter-high cylinders was subject to freezing.) The four new "duolift" electric elevators, coupled so that the cars counterbalance one another without weights, are as much a technical wonder as the original Edoux mechanism. They carry visitors from the second level to the summit without the change at midpoint formerly required.

The installation of these electric elevators in an entirely open shaft subject to high winds and considerable magnetic interference from television transmitters all but necessitated the reinvention of the elevator. Otis's early solution for protecting the suspended cables in traditional tubes was rejected by the Commission des Monuments Historiques as making the tower too opaque. Otis devised instead a system of electromagnetic clasps or "hands" at intervals of ten meters that grasp and release the cables above and below the traveling cabin according to programmed signals delivered by machinery housed in the pinnacle. At any

The architects of the Eiffel Tower restoration took some liberties, most notably in the new restaurant (bottom, left and right), new stair (below right) which replaced the famous spiral staircase (below left), and new elevator cabs, originally painted the same brown as the tower, but now a bright red and yellow.

Project: *Eiffel Tower, Paris.*
Original engineer: *Gustave Eiffel.*
Restoration architect: *M. Duhard.*
Client: *La Societé Nouvelle d'Exploitation de la Tour Eiffel.*

Project: *Pont des Arts, Paris.*
Original engineer: *Louis-Alexandre de Cessart.*
Restoration architect: *Louis Arretche.*
Client: *municipal government.*
Photography: *Deidi von Schaewen, except as noted.*

given moment only one of the 28 "hands" of each elevator shaft is open. Each cabin is equipped with a metal wedge to open the "hands" mechanically in case of signal failure. In addition, the suspended cables which traditionally control all the functions of an elevator car (opening and closing of doors, stop and start, telephone, etc.) have been replaced by a system of radio transmission connecting the machinery and the cabin. The four new cabins, which can function year round in winds up to 198 km/hr. carry 20 passengers each, or up to a total of 1700 visitors per hour. Surprisingly, the Commission des Monuments Historiques did not hesitate to authorize the architect to paint the rounded and generously glazed duolift cars in brilliant yellow and coral in order to "animate" the tower. Like some vast Constructivist project, inspired perhaps by the Pompidou Centre's popular outdoor escalators, these brightly colored cars can be seen from great distances climbing and descending the tower, while the former cars, discreetly painted in the same brown as the metallic skeleton, were perceived only up close. A more discreet display of Otis's invention, complementing the recently opened catwalk through the original machine room (worth a detour for even the most seasoned Paris tourist) would no doubt have been preferable to this carnival effect.

The installation of the new elevators required, moreover, the total reconstruction of the needle's core, as well as the redesign of upper platforms. A precipitous, suspended work platform with seven working "satellites" allowed workmen to dismantle and rebuild this core, working day and night in the winter of 1982–83, without ever closing the second level to visitors. The new core is entirely redesigned even to the point of creating a new symmetry in horizontal elements about the central vertical axis which never existed before. This correction of the needle's slightly "twisted" effect and the alteration of many profiles to keep water from collecting on the metal structure sparked some debate, but it is the replacement of the renowned spiral staircase connecting the second level to the pinnacle that has most upset the tower's fans. Immortalized in numerous photos and especially in the classic English comedy film "The Lavender Hill Mob" (1951), the stair was sold at auction in 1983. Several sections are scheduled to be installed in the new Museum of the Nineteenth Century in the former Gare d'Orsay where they will join fragments of the Pont des Arts. Others have been entrusted to the sculptor

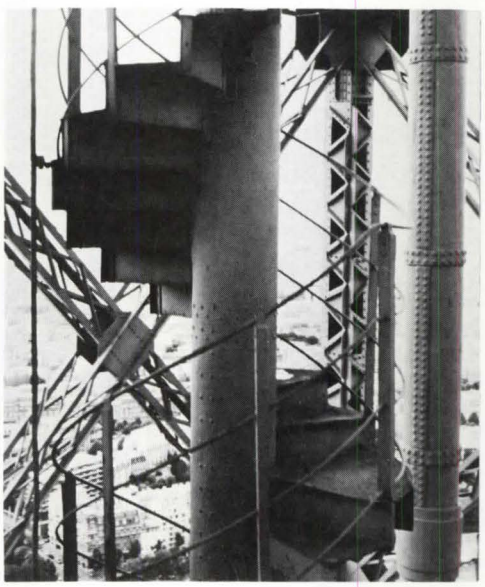
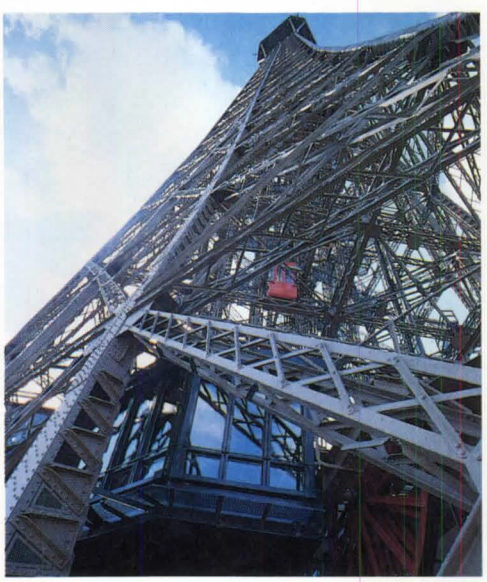


Photo: M. Belin



César who is completing a landscape sculpture of tower fragments in the park of the Cartier foundation at Jouy-en Josas, near Versailles. The new stair, while it will never gain the mythic status of its predecessor, is discreetly installed to retain the effect of a transparent open cage while serving as a more efficient emergency stair and a continual means of access to the adjacent elevators.

Of all the new security features invented to adapt the tower to the spirit, if not the letter of the city's code (the letter would have required encasing the tower in a dozen emergency stairs!), the most innovative are the water fire curtains surrounding the restaurants. These can resist flames for up to an hour, but unlike traditional steel fire curtains, they allow people to pass through and escape. Now that the spectacular external freight elevator and suspended work platforms have been removed, few tourists will suspect that Eiffel's most famous daring iron gesture houses some of the most up-to-date elevator and security equipment. As at the Pont des Arts, the 19th-Century industrial aesthetic has come to house the technology of another moment's modernity.

BARRY BERGDOLL, *who is completing his doctoral dissertation at Columbia on the 19th-Century French architect Léon Vaudoyer, writes frequently about architecture.*

On the Grand Canal

For almost 20 years, the Ca' d'Oro in Venice has been in some stage of restoration. Now behind its opulent façade (on which the cleaning has been halted because of the delicate condition of its facing marble) are the shimmering all-white galleries of the collection of Baron Giorgio Franchetti, who left the house to the State in 1917, five years before committing suicide. This, however, is not the only sad event associated with the house. It was originally built for a young bride who did not live to see its completion. And Carlo Scarpa, who had been commissioned for the present restoration by the Venetian superintendent of the arts, died before it was finished. Direction was then turned over to Francesco Valcanover, and Mario Semino finished Scarpa's work. But if the story of Ca' d'Oro is a sad one, it is also one that is full of anomalies.

In some respects this "House of Gold" might more appropriately be called the "House of Contradictions." While it is certainly the most famous house in Venice, and one of the most renowned in the world, it has never, like that small handful of other houses that have achieved similar esteem, been considered a masterpiece, even though some of the greatest artisans of the day worked on it. The house was, in fact, from the time it was built (1424–36), recognized as having an inharmonious and disorganized façade whose ills were intensified by its surfacing of green marble (instead of sensible and easily maintained painted stucco as was normal). This, along with its costly gold leaf and indigo decoration, was considered very ostentatious, not the least because it deteriorated rapidly in the saline, humid atmosphere of Venice, where the owner had to maintain it at great—and obvious—cost.

Ca' d'Oro is also unusual for a Venetian palazzo in that it incorporates parts of an older structure—a 13th-Century Veneto-Byzantine palazzo that previously occupied its site. And it is even more unusual in that even with these antiquated elements, which include a "recall" of the entire ground-floor loggia, and reused cable molding, capitals, and other decorative details of the façade, it is considered, along with the Doge's Palace, the high point of the floriated late Gothic style in Venice.

Another circumstance that makes Ca' d'Oro highly uncharacteristic as a Venetian palazzo is its asymmetry. It has been generally assumed that the original owner intended eventually to acquire the property at its left to complete the standard palazzo three-part organization composed of a major central portion flanked by identical minor bays. But even though extensive building records exist, this assumption has not been documented. A final, highly uncharacteristic element is the house's open loggia—a condition that exists elsewhere in Gothic Venice only at the Doge's Palace.

After almost 20 years of restoration, the Ca' d'Oro on the Grand Canal in Venice regains its place among the crown jewels of the Queen of the Adriatic.

When Marino Contarini, a procurator (state administrator) from one of the most patrician of Venetian families (eight doges), began Ca' d'Oro, he seems to have discussed the plans extensively with architect Marco d'Amadio. But it is generally believed that Contarini directly supervised much of the design and construction himself. Otherwise, it is difficult to explain how such illustrious artisans as Matteo Raverti, who had come to Venice following his important contributions to the Milan Cathedral, and Giovanni and Bartolomeo Bon, who had major commissions at the Doge's Palace, could have executed a façade that is truly masterful only in its individual parts.

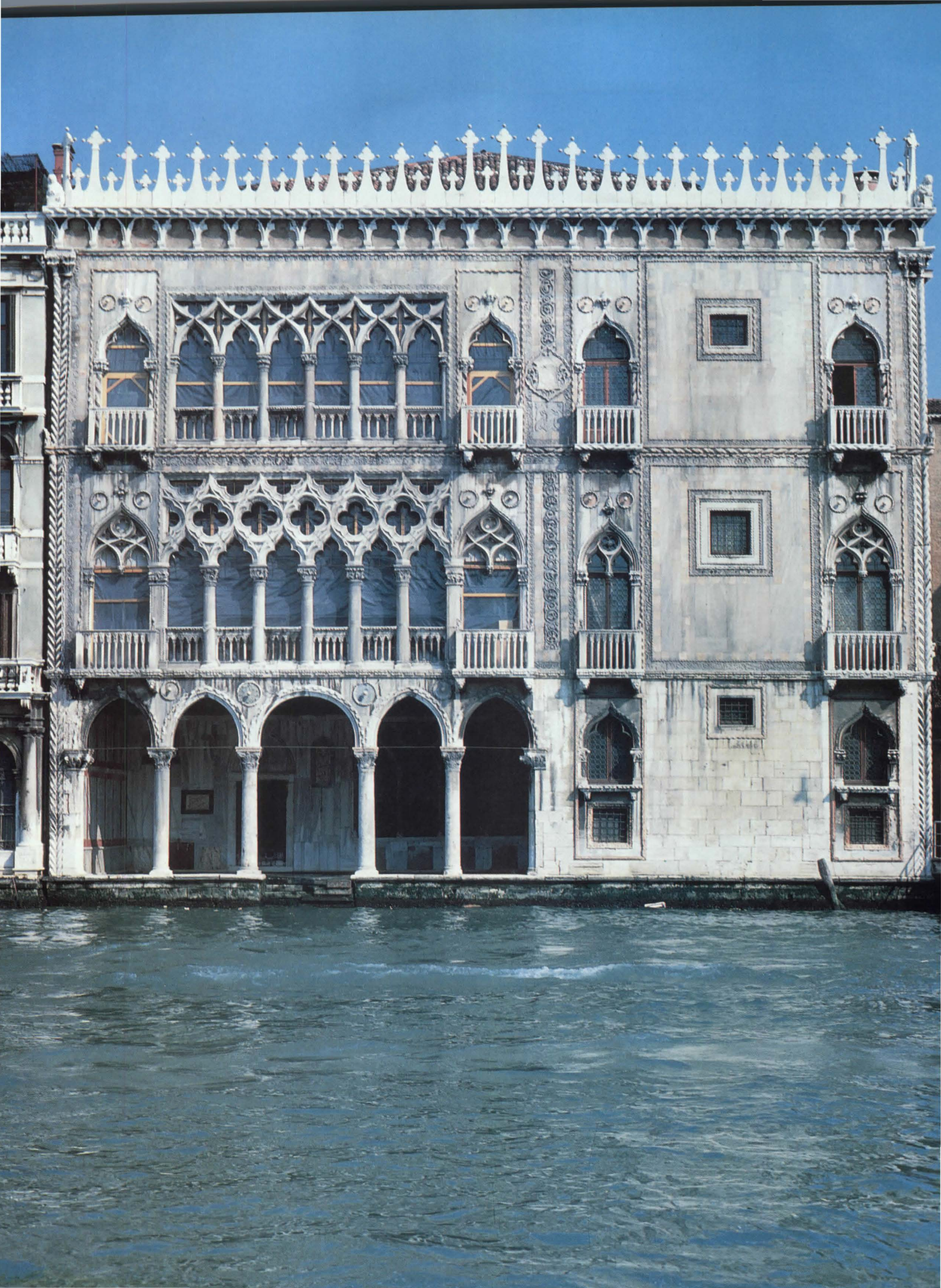
Recent history

The house passed down through the centuries relatively unscathed until Prince Alexander Trubetskoy bought it in 1840 for ballerina Maria Taglioni. She had a barbaric renovation carried out at the moment John Ruskin was completing his famous watercolor of the house.

When Baron Franchetti bought Ca' d'Oro in 1894, it had fallen into a sad state. He began a restoration and was able, through the use of earlier graphic records, to reproduce much that had been lost on the façade. He was also able to acquire Bon's original courtyard well curb—a masterpiece of Gothic sculpture—from a Paris dealer. He could not resurrect Raverti's monumental street gate, however, and could only make informed guesses at reproducing his courtyard external staircase, which Ruskin had described as "by far the most interesting Gothic monument of the kind in Venice," and which Mademoiselle Taglioni had sold as waste marble.

Although Franchetti's art collection was extensive and superlative, he had furnished Ca' d'Oro in a haphazard, 19th-Century vision of a medieval palace. Walls were hung with tapestries or painted in dark patterns; windows were draped and all floors were covered. And although the house had been turned over to the state in 1927, little could be done until it was free of the last legal resident in 1969.

The Ca' d'Oro is considered a high point of floriated late Gothic style in Venice not because of the overall disposition of its façade, but because of the masterful execution of its details by renowned artisans who also worked on the Doge's Palace and on the Milan Cathedral. The restored interior (following pages) houses the collection of Baron Giorgio Franchetti, who left the palazzo to the state in 1917.



One of the very appealing things about Ca' d'Oro, and probably the major reason it has always been so loved, is the way light seems literally to dance off the Grand Canal and onto its elaborate façade, which is much more deeply carved than others in Venice. In the current renovation, the designers, ever mindful of this condition, sought to intensify it by bringing that unique, shimmering quality of light to the interior. They first stripped the walls, then the floors, which revealed a light terrazzo surface. Walls were then stuccoed and painted with alternating coats of clear base and white paint to build up a deep, luminous surface.

The circulation throughout was simplified, and organized in each gallery in the direction of the long axis of the building—from canal to rear courtyard—to gain maximum benefit from the light. The small former living rooms running along the side of the *portego* (the central and main hall running the depth of the building, but which in Ca' d'Oro is not central because of the two-part instead of three-part plan division) have been opened up for greater communication among them, and between them and the *portego* and the canal.

Finally, the collection was completely reorganized before it was reinstalled on new, specially designed hangers for wall pieces and new bases for the sculpture. All of these installation devices are purposefully designed to reinforce the axis of the spaces and to intensify the openness by holding objects away from the floors or walls, to make them seem almost to float in the shimmering surroundings. Picture supports are linear strips of bronze, and sculpture bases are L-slabs of marble imperceptibly attached to walls.

The only reminder of Baron Franchetti today in the Ca' d'Oro, other than his art, is the Neo-Classical marble chapel he had built for Andrea Mantegna's St. Sebastian. It is now, though, framed by Scarpa's exquisite wooden screen, and is the first thing the visitor sees on entering the galleries.

[DAVID MORTON] ■

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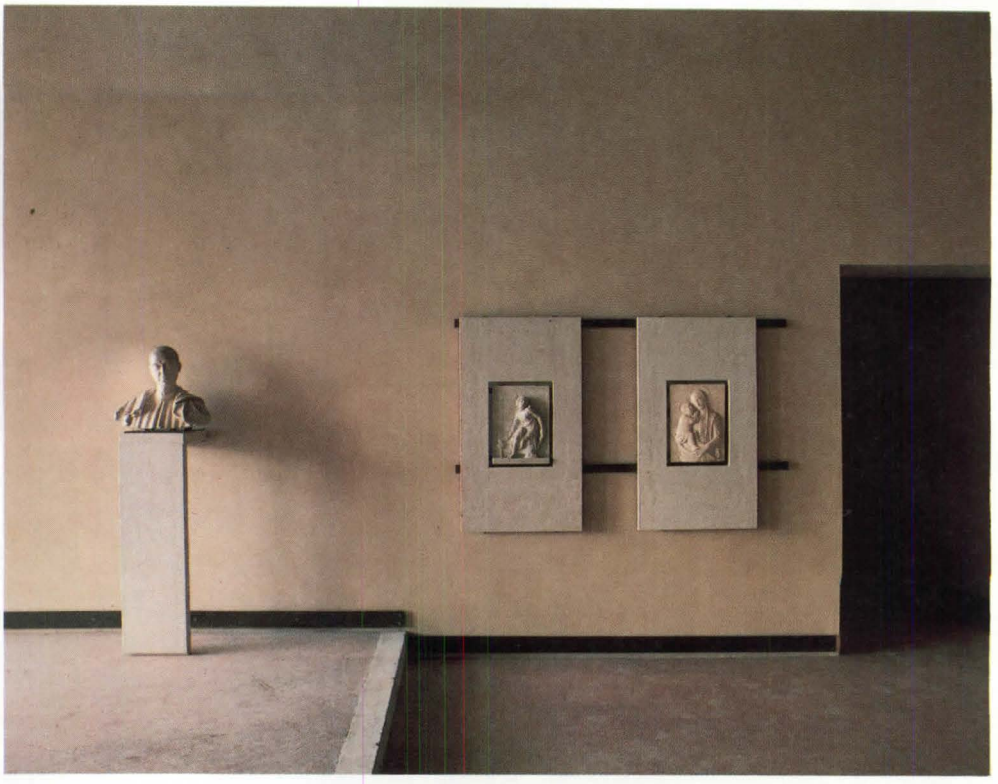
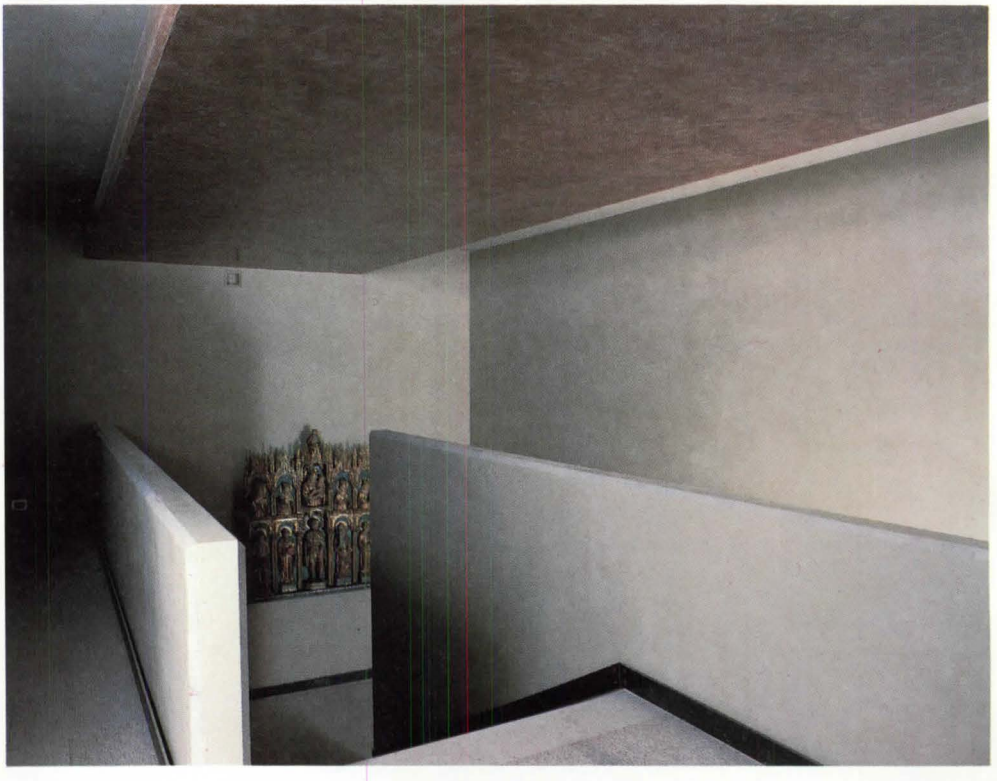




Inside Ca' d'Oro, walls have been painted white and circulation has been reorganized to parallel the building's axes, from Grand Canal to rear courtyard, to introduce as much light as possible to the galleries. Installation devices are specially designed to hold art away from walls or floors. Mantegna's St. Sebastian (right) is now framed by Carlo Scarpa's wooden screen.

Project: *Ca' d'Oro, Venice, Italy.*
Original architects: *Marco d'Amadio, Matteo Raverti, Giovanni and Bartolomeo Bon.*
Restoration architects: *Carlo Scarpa, Mario Semino, Francesco Valcanover.*
Client: *Michelangelo Muraro, Superintendent of Arts, Venice.*
Photography: *Massimo Listri.*

In the hills of Java

In an age in which impersonal boxes of mechanical systems, gift-wrapped in skins of elegant and not-so-elegant illusion, define our architectural experience, Borobudur is of another order. Constructed 1200 years ago in the tropical lushness of central Java, this masterpiece of Indonesian culture is the largest Buddhist monument in the world and a stunning example of religious art. Its recent restoration is also a showcase of international preservation cooperation and advanced scientific knowledge.

The restoration of Borobudur testifies to the benefits of international cooperation, careful investigation, and computerized management, all to save the largest Buddhist monument in the world.

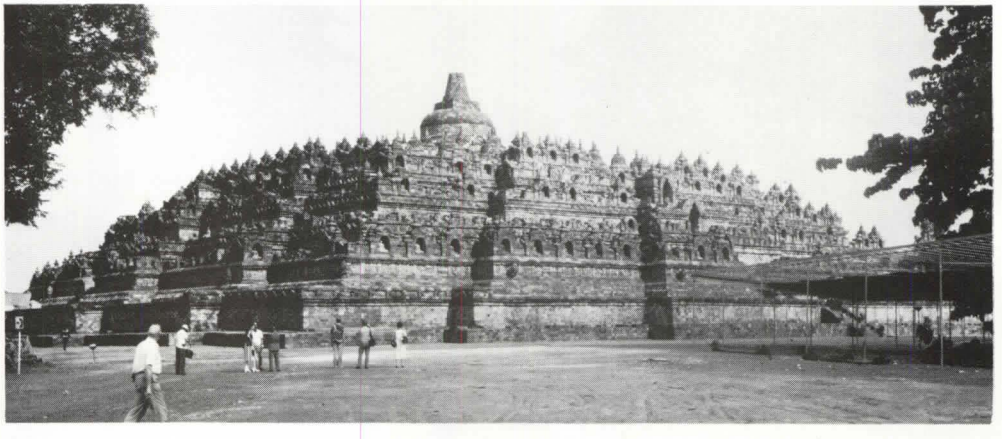
The Republic of Indonesia has spent nearly 30 years rescuing Borobudur from disintegration and collapse, assisted in this task by UNESCO and by direct bilateral support from other countries and institutions. Over $20 million was spent to dismantle, conserve, and reassemble its stonework and to strengthen the monument against the ravages of earthquakes and torrential rains.

The exact meaning of the word Borobudur is not known. The Indonesian archeologist and scholar R. Soekmono believes that it may relate to the architectural form of the monument and signify "the mountain which is terraced in successive stages." There is consensus that Borobudur was built ca. A.D. 780 to 856 as the principal structure of a Buddhist monastic community. The monument is a stepped, dry stone pyramid 105 feet high constructed at the crown of a low hill, on the edge of the Kedu Plain, near Magalang. It is composed of ten successive stages: nine stone terraces rising to a large, bell-shaped stupa. The design is based on an interplay of squares and circles, characteristic of so many great examples of Buddhist architecture. The first terrace is 403 feet square; it and the five succeeding square-plan terraces have balustrades and walls covered with 1460 panels of bas-relief sculpture representing scenes from the life and teaching of Buddha, and from other sacred Buddhist texts. The three upper terraces are circular in plan, as is the crowning stupa.

The stone of Borobudur is gray-brown volcanic andesit/basalt, and each has been shaped and placed without mortar to permit slight movement in the event of earthquake and settlement. The top of the hill around which Borobudur is constructed was asymmetrical, so earth fill was used to complete the core of the structure.

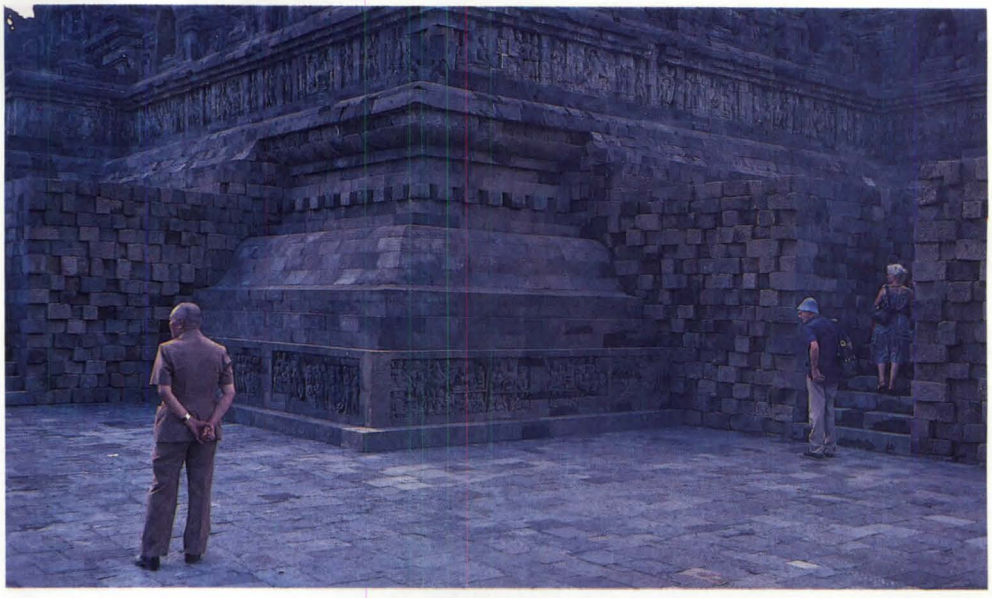
Access to the terraces and stupa is by four sets of steep stairs at the center of each side.

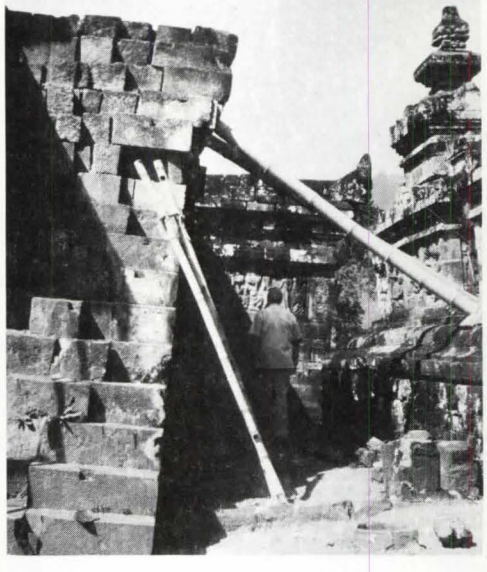
Dean Conger © National Geographic Society



Built during the 9th-Century A.D., Borobudur (above) provides a physical model of the Buddhist spiritual universe, organized as a progression from the World of Desire, through the World of Form, to the World of Formlessness. Borobudur's 1460 bas-relief panels that cover the walls and balustrades of its square terraces depict the life and teachings of Buddha and record the architecture and customs of 9th-Century Java (right).

The sections (right) show the extent of the preservation work, including the dismantling of the four square terraces, the pouring of concrete slabs under the balustrades to better distribute their load, the application of an Araldite-tar-epoxy coating on internal stonework to prevent water seepage and erosion, and the installation of drain pipes and fill to improve runoff. The photographs (bottom) show the condition of Borobudur before and during preservation. The project engineers used computers to keep track of the stones and ensure that they were returned to their original location. The "hidden foot" (top), covered during Borobudur's original construction because of slippage, was left partly exposed to show the pyramid's original profile and its carvings representing the World of Desire. The corridors in the World of Form (opposite page) typify the monument's rich ornament and its precise, dryset stonework.





Unlike most other ancient Hindu and Buddhist temples in Java, Borobudur has no interior space for worship. It is a holy place intended for pilgrimage and learning—a three-dimensional architectural expression of a religious concept. By means of its plan, form, and decoration, it symbolizes the 9th Century Buddhist understanding of the cosmos and the path that human beings should take through it to achieve enlightenment.

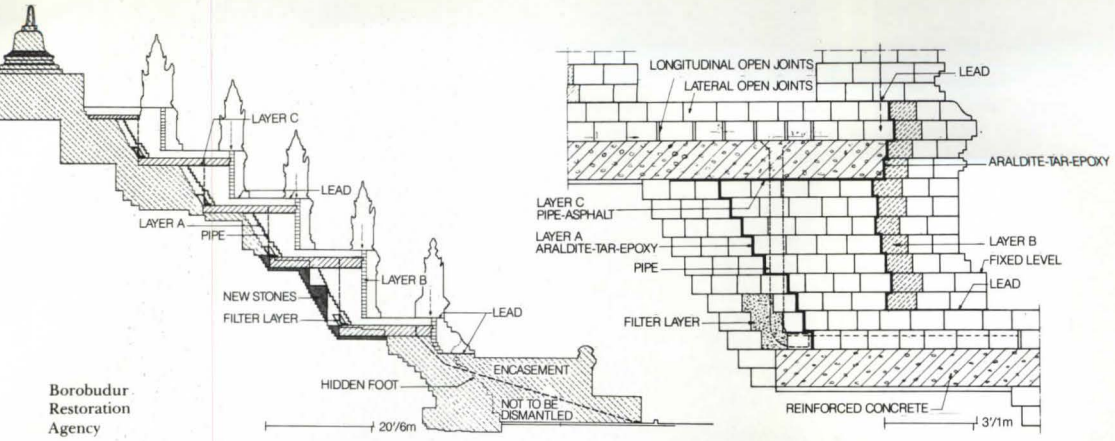
Borobudur represents three levels, or "worlds," of consciousness. The lowest terrace represents the World of Desire (kamadhatu), the state of consciousness in which human beings are still the prisoners of their own desires. The succeeding four terraces represent the World of Form (rupadhatu) where dependence on earthly desires has been mastered but where one is still subject to the natural laws of form and matter. After a transitional terrace, the three circular upper terraces and final stupa represent the World of Formlessness (arapadhatu) where one is released from all earthly ties and can participate directly in the experience of enlightenment.

Soon after construction began, the builders noticed significant settlement. To arrest this, the original base was encased with nearly 13,000 cubic meters of stone to form a new base strong enough to impede further slippage. The 160 bas-relief sculptures on the face of the original base, representing scenes from the World of Desire, were covered over and lost from view, not to be rediscovered until 1885, at which time they were first photographed. One corner of this "hidden foot" of the monument was left exposed as part of the recent restoration work so that the early profile of Borobudur and some of the "kamadhatu" carvings can be appreciated.

Traditionally, one visits a Buddhist monument by circling it clockwise; this is called "pradaksina." At Borobudur the visitor first circumnavigates the base, originally to study the now hidden bas-relief carvings from the World of Desire, then mounts the east staircase, and continues to circle the monument to the top.

The vertical surfaces of high balustrades on the left and of the main wall on the right are covered with 1300 sculptured panels that are the artistic glory of Borobudur. In depicting stories, such as the life of the Buddha in a 120-panel series taken from the *Lalitavistara* text, the stone carvers provided information about the geography, plants, animals, architecture, commerce, music, and customs of 8th- and 9th-Century Java, in addition to the religious teaching. The balustrade walls were built of sufficient height so that only the panels and the sky could be seen. It is an architectural environment deliberately designed for spiritual learning. Atop the main walls, and forming part of the exterior elevations of the next level of balustrades, are stone arches sheltering figures of Buddha seated. The hand positions, or "mudras," of the statues are different on each of the four sides of the monument. It is the complex silhouette and detail of the balustrades that gives Borobudur its essential character when seen from a distance.

Upon completing the tour of the fourth terrace, the visitor passes through a narrow archway and ascends to the sixth terrace, before the plan changes from square to round. Then, the richly carved decoration and dense visual information of the World of Form give way to an architecture of abstract simplicity. The confining balustrades are gone, and now in the World of Formlessness one can look as far as the eye can see. Arranged in concentric circles on the three last terraces are 72 small, bell-shaped stupas constructed of stone blocks perforated so that one can peer into each to see a statue of a seated Buddha at prayer. These figures have a "mudra" different from those of the World of Form. At the very top, the stupa moves gracefully from circle to square to diminishing octagon and then vanishes into the free-



Borobudur Restoration Agency

dom of the infinite. The architecture has done its work. The teaching is complete.

It is believed that Borobudur fell into disuse well before the Javanese converted to Islam in the 15th Century. Eruption of one of the volcanoes that ring the Kedu Plain is a possible cause. Borobudur was rediscovered in 1814 when Java was administered by Sir Thomas Stamford Raffles during a brief British interregnum in Dutch colonial rule. Centuries of abandonment had taken their toll. The results of earthquakes, water penetration, uncontrolled vegetation, and vandalism could be seen in the cracked and tilting walls, collapsed balustrades, undulating terraces, and broken or missing sculpture.

The Dutch colonial administration commissioned the first major preservation and stabilization plan in 1900. Dutch army engineer Theodoor Van Erp carried out extensive work from 1907 to 1911. The "hidden foot" was uncovered and photographed for the second time, the encasement stabilized, and the uppermost balustrade, three circular terraces, small stupas, and the final great stupa dismantled and reassembled.

In 1955, the Republic of Indonesia, concerned about the continuing decay of the monument, requested UNESCO to send consulting experts to assist in identifying the conservation problems. For the next 17 years, a multidisciplinary research effort was carried out that brought together an impressive array of skills including air photo analysis, archeology, architecture, chemistry, conservation, engineering, seismology, foundation engineering technology, landscape planning, planning, meteorology, microbiology, petrography, physics, soil mechanics, surveying, and terrestrial photogrammetry.

From 1971 to 1973 the final project took shape, and in 1972, UNESCO launched the International Campaign for the Safeguarding of Borobudur, similar to its campaigns for Venice and Abu Simbel. More than $6.5 million was raised from 28 countries and a number of private and nongovernmental organizations. Indonesia, however, met the bulk of the cost.

The preliminary project report, "The Restoration of Borobudur" issued in 1972 by NEDECO (Netherlands Engineering Consultants), who had been retained by the government, identified three principal causes of deterioration: physiochemical and microbiological attack; inadequate drainage; and severe settlement cracking and subsidence, especially of the first, second, third, and fourth terraces and balustrades, caused by insufficient bearing capacity of the soil beneath the monument and uncontrolled washing away of the soil fill in the center of the monument.

The report called for a series of preservation measures to stabilize Borobudur and to reduce further deterioration to a minimum. These included: Installation of a drainage system to provide rapid runoff for rainwater; introduction of waterproof layers to prevent further water infiltration and seepage; and introduction of reinforced concrete slabs under areas of heavy compressive load to distribute the compressive load evenly over a wider area.

It was decided that preservation work would include the four square terraces and balustrades, and the plateau between the fourth square terrace and the first circular terrace, but not major work to the ground-level encasement surrounding the "hidden foot" or work on the three circular upper terraces and the final stupa. The Van Erp work at these areas has held up adequately, and only cleaning of the stone was necessary.

The execution of the work required removal, treatment, and replacement of all of the outer stones and many of the inner stones of the affected areas. Over 800,000 stones were moved in the course of the project. In addition to the reinforced concrete slabs installed to distribute the compressive loads evenly, the scheme called for the installation of a sophisticated series of waterproof layers. One layer of Araldite-tar-epoxy was painted over the surface of reset inner stones to pre-

A queue of Buddhas (this page, bottom) sit, ready for conservation, each on his own pallet. The pallets allowed the use of tower cranes and fork-lift trucks to dismantle and reassemble the monument. The World of Formlessness (this page, top) contains circular terraces and bell-shaped stupas enclosing statues of Buddha. Since the Dutch had stabilized these upper three terraces in the early 20th Century, the recent preservation effort involved only their cleaning. The movement from the enclosed corridors in the World of Form to the open terraces of the World of Formlessness occurs through a low arch centered on the crowning stupa (right). It is, without a doubt, one of architecture's most dramatic moments.

vent seepage between the filled earth core of the monument and the outer stones. A vertical layer of treated inner stones was also covered with Araldite-tar-epoxy, two courses behind the outer decorated stones, to prevent moisture moving through the decorated stones by means of capillary action. There is also a third layer of asphalt on the underside of the new reinforced concrete slabs. A new system of hidden drain pipes was installed flush with the concrete slabs and beneath the open joints of the relaid terrace floors to carry away rainwater runoff. A filter layer of volcanic sand to aid in drainage was provided within the wall at each terrace level.

To achieve the work, NEDECO developed the following schedule of tasks: Dismantle, transport, and store outer stones; clean, repair, and treat outer stones; construct reinforced concrete foundation slabs; transport and treat inner stones; insert the filter layer and waterproof layers; and replace and reconstruct balustrade stones.

NEDECO devised an ingenious system to transport the stones from the monument to the work area southwest of it. A series of small, hand-operated cranes at all levels transported individual stones from their original location to specially designed wooden pallets. Tower cranes on tracks transported the stones vertically in the wooden pallets from the terraces to the ground. Fork-lift trucks transported pallets to the crane gantry at the southwest side of the hill, which lowered the pallets from the hilltop to the working area at the foot of the hill. Fork-lift trucks transported pallets in the working area and to temporary and final storage areas.

Workers dismantled the stones on opposite faces of the pyramid simultaneously so as not to disturb the equilibrium of the monument. The balustrades were taken down first, then the inside terrace walls and floors, and finally the inner stones. Each outer stone was numbered, moved, inspected, cleaned, disinfected, treated, repaired, and stored for eventual replacement. All stones were recorded by conventional photography and by stereophotogrammetry. An outstanding technological advance of the Borobudur project was an innovative computer program, developed by IBM in cooperation with the Government of Indonesia, to number and track the path of each stone through the entire complicated preservation sequence. The development of this computer program marked a great step forward in large-scale preservation project planning, and it is to be hoped that it will be closely studied and evaluated when other projects of a similar complexity are undertaken in the future.

Borobudur has been a milestone in international cooperation. A masterpiece has been preserved. Its voice is from another time and its vocabulary is unfamiliar to many of its visitors, but its message is clear if we take the time to listen: The truth will set you free. ■

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Project: *Borobudur, Java, Indonesia.*
Restoration architects: *Theodoor Van Erp (1907–11); Netherlands Engineering Consultants (1972–83).*
Client: *Indonesian Government (Badan Pemugaran Candi Borobudur); UNESCO (International Campaign for the Safeguarding of Borobudur).*
Consultants: *Consultative Committee for the Safeguarding of Borobudur.*
Photography: *W. Brown Morton III, except as noted.*

Trajan's Column
Arch of Constantine
Rome, Italy

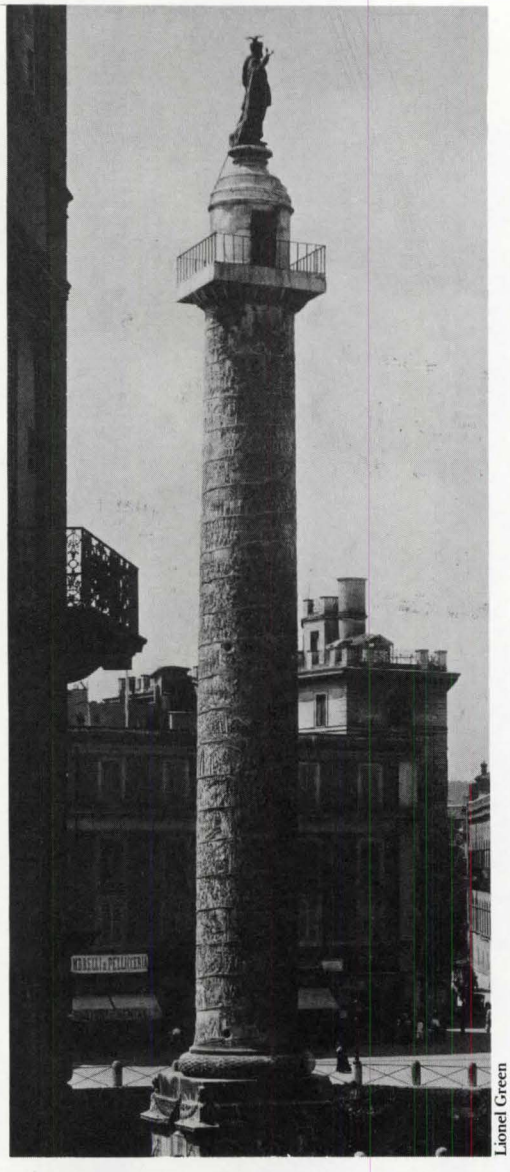
In the Forum

The visitor to Rome today is confronted by numerous monuments, churches, and museums that are either hidden behind scaffolding, missing from their familiar locations, or simply closed. The equestrian statue of Marcus Aurelius has left the Campidoglio to undergo restoration in Trastevere, and the bronze angel atop the Castel Sant'Angelo was removed by helicopter earlier this year for the same purpose. The Borghese Gallery and many churches are closed indefinitely for repairs, prompting such facetious baptisms as Santa Maria Sempre Chiusa (St. Mary Always Closed), or SM. in Restauro.

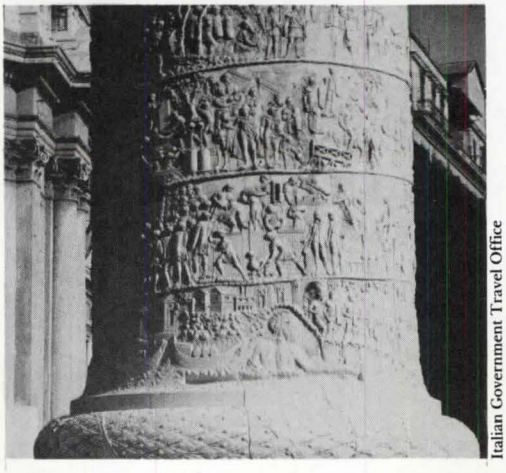
Two major monuments of Imperial Rome—Trajan's Column and the Arch of Constantine—are currently undergoing restoration in the Eternal City.

After years of discussion, the Italian government in 1981 passed a law to take urgent steps to study and protect the "archeological patrimony of Rome." Scaffolding, including fiberglass roofs as a shield from acid rain, was immediately erected over many monuments. Although the ubiquitous scaffolding and green mesh "cover" present a less romantic picture of Rome, it provides a unique opportunity for the close study of ancient monuments.

Cleaning and restoration work began this spring on the Arch of Constantine and the Column of Trajan, whose ultimate fate regarding conservation remains uncertain. Both stand in the area of a proposed Archeological Park, to stretch from the Piazza Venezia to the Colosseum, which is seen as one answer to the problems caused by cars in the Historic Center of Rome.



Lionel Green



Italian Government Travel Office

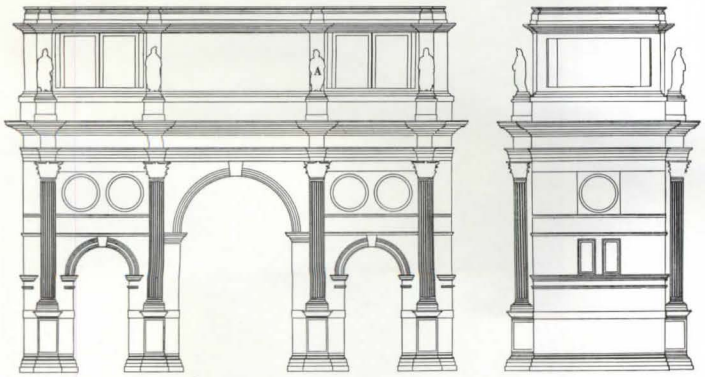
Inside Trajan's Column (these pages), a spiral staircase rises behind the 2500 sculptured figures of its 125-foot-high shaft. The only monument in Trajan's Forum to survive almost intact, it has lasted primarily because of its early association with Christianity.

Trajan's Column

Previously one of the most visible monuments, the freestanding marble shaft of Trajan's Column is now hidden behind an intricate cage of steel pipes and stairs. It was constructed in A.D. 113 to commemorate Trajan's victory over the Dacians, a barbarian tribe on the northern frontier of the Roman Empire. A continuous band of sculptured reliefs 670 feet long representing the history of the wars rises with 2500 figures in 23 spirals around the column.[1] Exactly 100 Roman feet high (125 feet, 38 m.), the Column has the entasis of an Ionic column but culminates in a Doric capital, appropriate as a base for the statue of Trajan that originally stood atop, but which was replaced by one of St. Peter in 1588. A spiral stair, lighted by slit windows ingeniously concealed within the sculptures on the exterior, is hidden within 17 superimposed drums of Carrara (ancient Lunense) marble. Within the cubic base of the Column was a gold urn containing the ashes of Trajan and his wife, Plotina.[2]

The spiraling band of sculpture was painted to highlight details, and metal swords and spears held by the stone soldiers added to the narrative's realism.[3] The Column was a newsreel, recording exploits whose booty helped to finance the construction of the Forum itself. A monument to victory and power, it is the only element of Trajan's Forum to survive almost completely intact today. Its preservation during the Middle Ages, a period when many Roman monuments were either destroyed, pillaged, or converted to Christian use, was assured only by its transformation into the campanile of

Trajan's Column
Arch of Constantine



the church of St. Nicolas of the Column.[4] In 1163, the Senate of Rome, the last vestige of the original institution, declared Trajan's Column to be under its protection in honor of the Church and the People, to ensure that it would "remain whole and undiminished as long as the world lasts."[5] In the 16th Century, plans for the renovation of the Forum area included the removal of San Nicola de Columna and the excavation of the Column to its original level. Michelangelo, who lived in the neighborhood, had proposed an enclosure wall in 1548 to give an architectural setting to the Column, but the project was never carried out and the plans were lost.[6] A wall was finally built in 1570 by Giacomo del Duca, which appears in Piranesi's prints of the column, but it was torn down in the 1930s when Mussolini hastily plowed up the site to build the Via dei Fori Imperiali.

Arch of Constantine

At the other end of the proposed Archeological Park, opposite the Colosseum, stands the Arch of Constantine, built in A.D. 315 to commemorate the victory of Constantine over his rival Maxentius at the Milvian Bridge. Long a source of both aesthetic and religious controversy, the arch's attic bears the cryptic inscription attributing Constantine's conquest to Instinctus Divinitas, a sign to some of his early belief in Christianity.

This arch is Alberti's paradigm of the triumphal arch: Its high central portal flanked by two lower arches with an attic story above was probably originally topped by bronze horses and chariot.[7] However, it is covered with a pastiche of sculptural spoils pillaged from earlier monuments. Fine medallions and reliefs from monuments of Hadrian and Marcus Aurelius and from the Forum of Trajan are juxtaposed with the crude Constantinian reliefs carved specifically for the Arch.

Raphael, in a letter to Pope Leo X in 1519, cites his admiration for the architecture of the Arch, as opposed to the Constantinian sculpture, which he finds to be "stupid, ridiculous, and without art or design," in contrast to "the spoils of Trajan and Antoninus Pius which are excellent and in pefect manner."[8] Later critics, from Vasari to Berenson, have pointed to the Arch as an example of the decline of late Roman art.

Lorenzino de Medici is accused of decapitating the figures of the Dacian captives in the 15th Century. The debris that covered the Arch up to the plinth of the columns was removed by Pope Paul III in preparation for the triumphant entry of Charles V in 1536, after the Sack of Rome. Pope Clement VIII absconded with one of the *giallo antico* columns, placing it in the Lateran to form a pair with another from the Forum of Trajan.[9] Finally in 1731, Pope Clement XII began a general restoration of the Arch, supervised by Alessandro Capponi. The missing column was replaced, although with a different color marble. All the heads of the Dacian slaves, including one entire statue, were restored by the sculptor of the Trevi Fountain, Pietro Bracci,[10] who used white marble for the heads, in contrast to the bodies which were of pavonazzeto, a lavender-veined stone.

Traffic was an early problem for the Arch of Constantine. A wall built around it in 1806 to prevent carriages from driving through was demolished in 1836. And, paralleling events of 1536, scaffolding was erected in 1938 to clean the Arch in preparation for Mussolini's reception of Hitler.[11] In fact, the present appearance of the area is due to Mussolini, who in the 1930s paved and opened to traffic the zone around the Arch and the Colosseum, tearing down in 1936 the standing remains of the ancient monumental fountain, the Meta Sudante. This area has been closed again to cars and the foundations of the Meta Sudante are being reexcavated.

Deterioration

Nineteenth-Century photographs of the Arch of Constantine and plaster casts of Trajan's Column made in 1863 at the behest of Napoleon III, and now in the École des Beaux Arts in Paris, the Victoria and Albert Museum in London, and the Museum of Roman Civilization in Rome, all show by comparison to the originals the extent of the irreparable damage done to them over the years by air pollution from automobiles and heating fuel. More deterioration has occurred in the last two decades than in the past 1000 years, and in fact many of the monuments may not survive into the year 2000 if the present rate continues.[12]

The major problem is less from car exhaust than from the burning of heating fuel which produces sulfur dioxides and forms sulfuric acid when in contact with moisture in the air. This acid combines with the calcium in marble to make gypsum (calcium sulfate) or plaster of Paris. On unprotected surfaces, a thick, black crust forms, beneath which the sculpture either turns to powder or is preserved in a way not yet understood. In some areas, a golden-brown patina, probably applied in Antiquity, has perfectly conserved all detail below.[13]

The surface of Trajan's Column is pockmarked with thousands of little craterlike holes (bucherellatura) caused by action of the wind and rain. Water has also eroded the joints between the marble drums of the Column, as well as outlining many of the figures in channels and grooves.

In the past, concrete had been used as a mortar, although its strength has cracked the softer marble. It is now being replaced with a soft mortar made with powdered marble.

Distilled water free of damaging salts is used as the main cleaning agent, in conjunction with an ordinary toothbrush to reach difficult areas of decay. Tougher encrustations of dirt are removed with a paste of cellulose and wood pulp (ammonium bicarbonate) applied in a pack and covered with aluminum foil for one to two days.

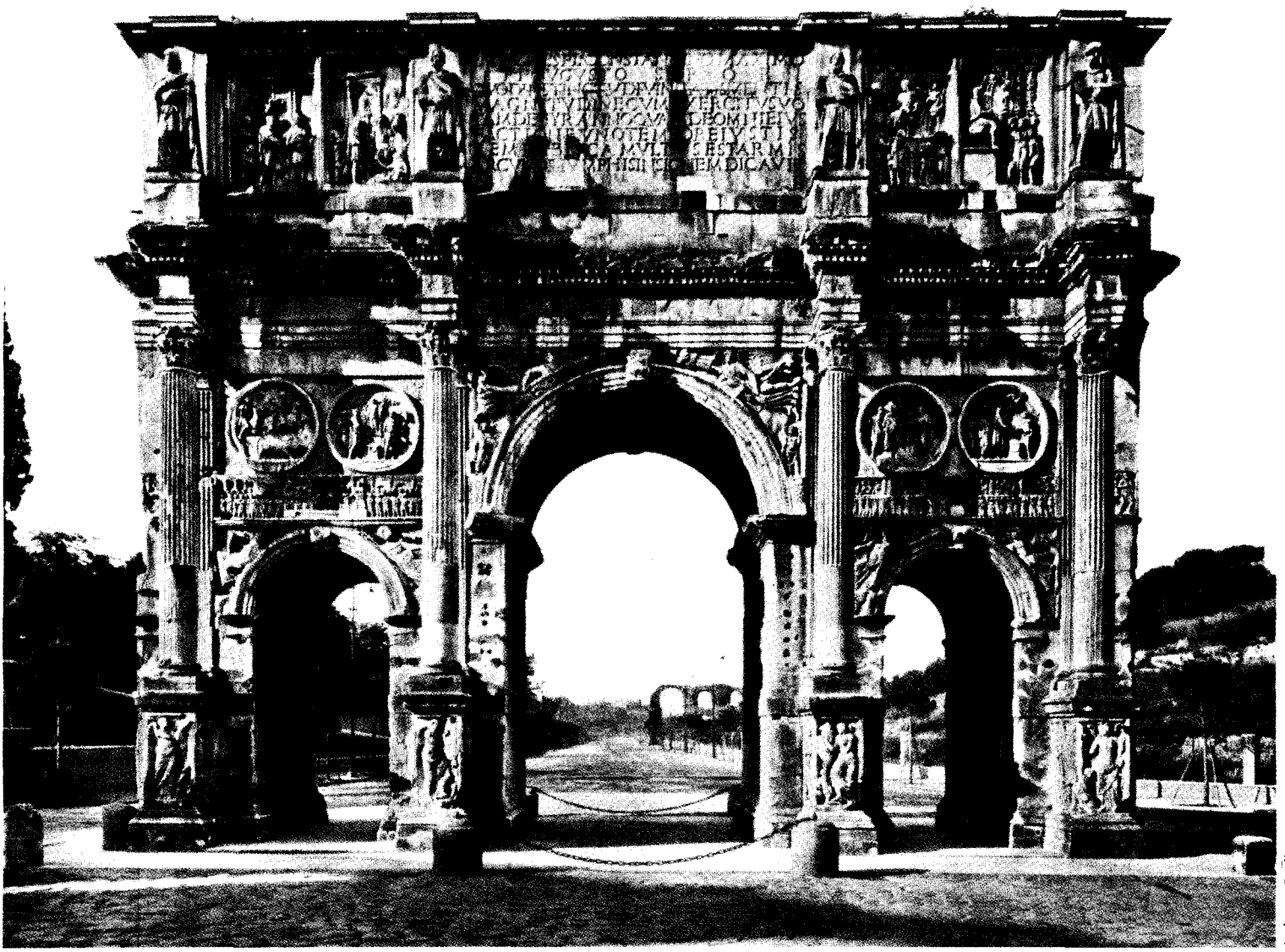
Another technique, used to clean borders and to remove the last vestiges of concrete from narrow joints, is a combination of compressed air and a very fine spray of abrasive aluminum oxide powder, a kind of microsandblasting. Finally, little beads of an acrylic resin called Paraloid are dissolved in a mild solvent and applied to the surface of the stone. The solvent evaporates leaving the plastic in the marble as a consolidating and protective agent.

The proposed Archeological Park conceived in part as a solution to the pollution problem would extend the 1887 plan for Rome, which saved from development the open areas from the Campidoglio to the Appian Way, including the Baths of Caracalla and the Circus Maximus. The present controversy concerns the first phase of the project: closing the Via dei Fori Imperiali and excavating large segments of the Forums of Caesar, Augustus, Trajan, Nerva, and the Temple of Peace, which lie beneath it. This parade route of Mussolini's is defended mainly by the right-wing Gruppo dei Romanisti and the Msi Party who ironically use the preservationists' arguments in their attempt to save what they consider to be a "monument" of Fascist planning. On the other side are archeologists such as Filippo Coarelli, who see this as an opportunity to uncover "the greatest architectural complex in Europe" and to "reunify areas already excavated" which because of their "fragmentary character are incomprehensible in their relationship to each other."[14] He likens the situation to the Agora in Athens, a similar large archeological site in a city that was successfully opened to the public as a park.

Giangiacomo Martines, architect of the Archeological Superintendence of the Roman Forum, does not see the problem as a conflict between archeology and urbanism, believing that the ancient monuments can be brought to life, as the opera in the Baths of Caracalla

The Arch of Constantine was considered by Alberti to be the paradigm of triumphal arches in its overall form (drawing far left) but not in its decoration, which is a pastiche of sculptural spoils pillaged from earlier monuments. The figures, decapitated by the Medicis in the 15th Century, were restored in the 18th Century using a different colored marble from the originals (right, and cover).

Barbara Bini



Anderson Studio

proves. Under his direction, the Meta Sudante is being reexcavated and its function as a fountain revived. Carlo Aymonino, Counsel to the Historic Center of Rome, also points to the necessary reconfiguration of the edges of the city bordering the Archeological Park. He proposes an international symposium to study the problem.[15] He has also designed a theoretical reconstruction of the Colossus of Nero near the Colosseum. The original statue stood 125 feet high and was changed after Nero's death into an image of the sun god. In Aymonino's scheme, the Colossus is imprisoned in a stone wall.[16] This is at once a practical proposal and a metaphysical comment on the current dilemma of architecture concerning the reexcavation of history and memory. In Rome this has been a live issue, discussed and acted upon for over two and a half millenia. ■

ALEXANDER C. GORLIN, *an architect at Kohn Pedersen Fox, New York, teaches at Yale, and wrote this article while a Fellow at the American Academy in Rome this year.*

Footnotes

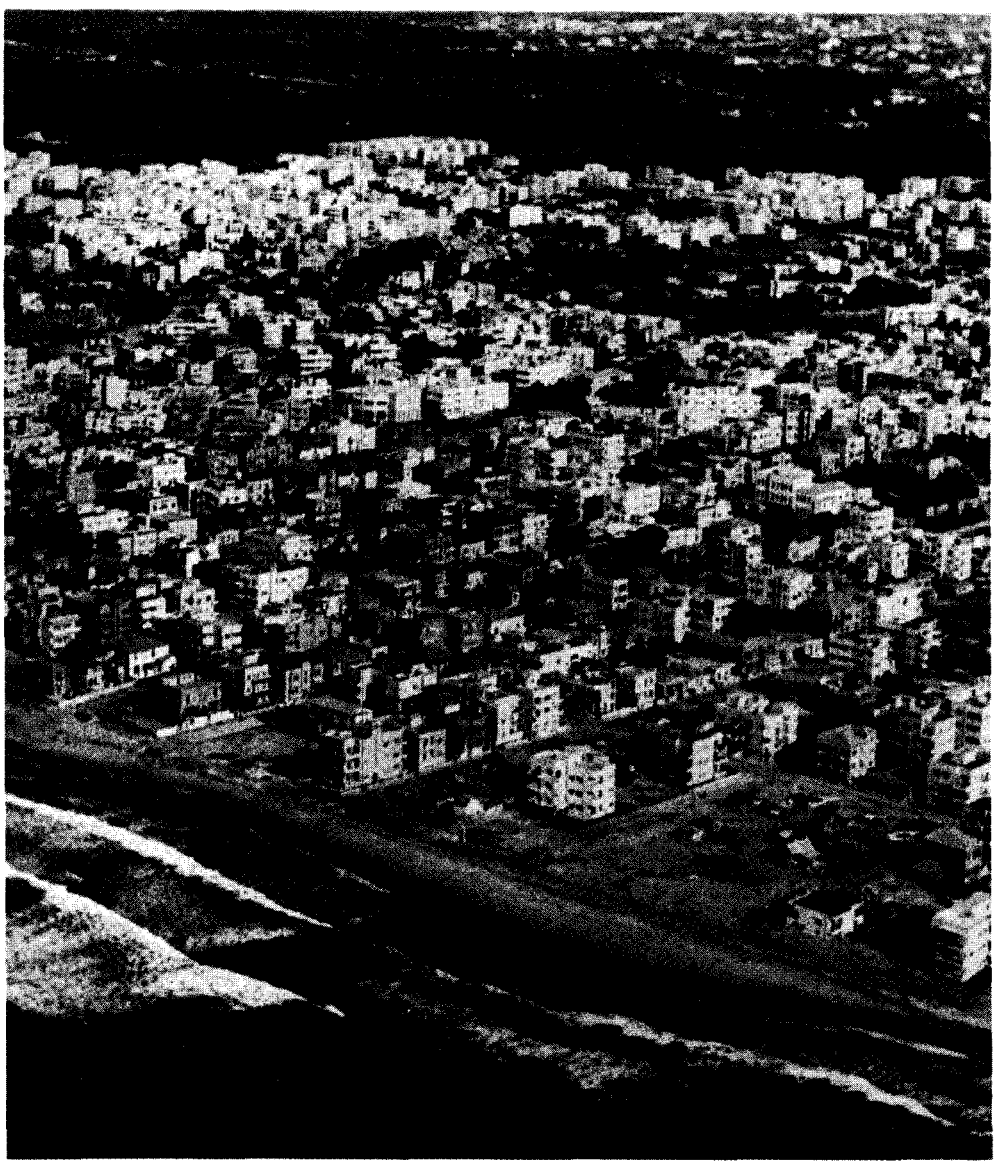
1 Lino Rossi, *Trajan's Column and the Dacian Wars* (London 1971), p. 13.
2 Samuel Platner, Thomas Ashby, *A Topographical Dictionary of Ancient Rome* (London 1929), p. 243.
3 Giangiacomo Martines, *La Colonna variopinta, FMR;* May 1984, p. 96.
4 Salvator Settis, *La Colonne istoriata, FMR;* May 1984, p. 70.
5 Richard Krautheimer, *Rome, Profile of a City—312–1308 A.D.*, p. 198.
6 Sandro Benedetti, *Giacomo del Duca e l'architettura del Cinquecento* (Rome 1972), p. 187.
7 Philip Fehl, unpublished article on *Vasari and the Arch of Constantine,* 1984.
8 Antonio Giuliano, *Arco di Constantino* (Milano 1955), p. ii.
9 Lanciani, *The Ruins and Excavations of Ancient Rome* (London, 1897), p. 194.
10 F. Coarelli, *Guida di Roma.*
11 Fehl, *Vasari and the Arch of Constantine.*
12 Adriano La Regina, *The New York Times,* 16 March 1980.
13 Peter Rockwell, ICCROM; Preliminary Study of the Carving Techniques on the Column of Trajan, May 1983.
14 Filippo Coarelli, Dialoghi di Archeologica 1981, *#2, Editoriale,* p. II–IV.
15 Carlo Aymonino, *La Repubblica,* 7 July 1984, p. 29.
16 *Domus,* June 1984, p. 18.

The White City

Tel Aviv of the 1930s was the first city in the world to be constructed almost entirely in the International Style. Aerial photographs clearly reveal the white cubes that made up the typical urban fabric. While only a few of these buildings can compare with the exemplary structures erected several years earlier in Europe, no other city could boast such a mosaic of houses of similar size and form. In Jerusalem and Haifa as well, whole neighborhoods were constructed almost entirely in the International Style. In fact, the uniqueness of Modern architecture in Israel comes from a synthesis of various progressive influences and schools of architecture.

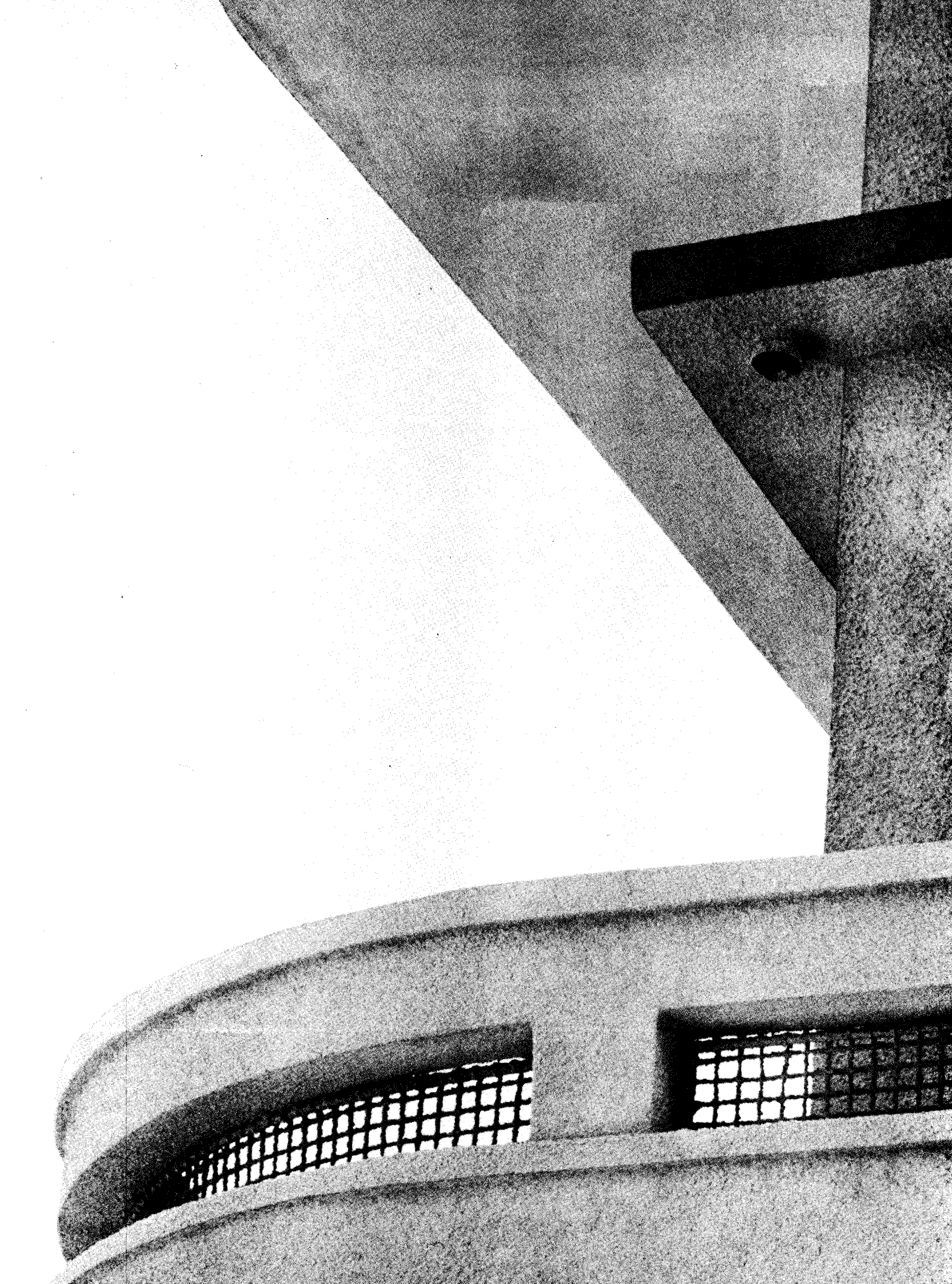
In the 1930s, an influx of Bauhaus-trained architects turned Tel Aviv and other Israeli cities into a national experiment in the International Style.

The most common term for this style in Israel is "Bauhaus," even though the Bauhaus was an institution rather than a style. The term probably caught on because of the 19 former Bauhaus students in various design fields who continued their work in Mandate Palestine after leaving Germany. Periods of apprenticeship with leading modern European architects have left their imprint. The most notable mentors were Le Corbusier (the greatest influence on Modern Israeli architecture), Erich Mendelsohn, who worked in Palestine between 1934 and 1941, Auguste Perret, Hans Poelzig, Bruno Taut,



Tel Aviv in the 1930s (above), and a typical International Style house of 1935 (facing page), designed by H. Mishlum.

The exhibition White City: International Style in Israel, *organized by the Tel Aviv Museum, can be seen at the Jewish Museum, New York, through February 15, 1985. Judith Turner's photographs are taken from the book* White City: International Style Architecture in Israel/ Judith Turner: Photographs, © *1984, the Tel Aviv Museum and Judith Turner.*



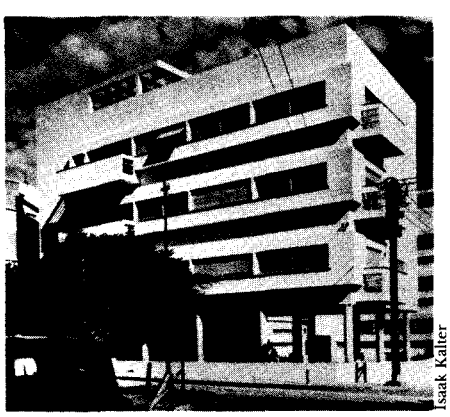
Precursor: International Style in Israel

Hannes Meyer, and Mies van der Rohe. Architects in Mandate Palestine favored machine-inspired shapes, but not for any ideological or theoretical reasons; rather, they admired the machine aesthetic for its own sake. For example, despite its square form, Mendelsohn's Weizmann Residence in Rehovot also resembles, from certain angles, a ship, with its prominent cylindrical staircase and the circular windows in the solid walls.

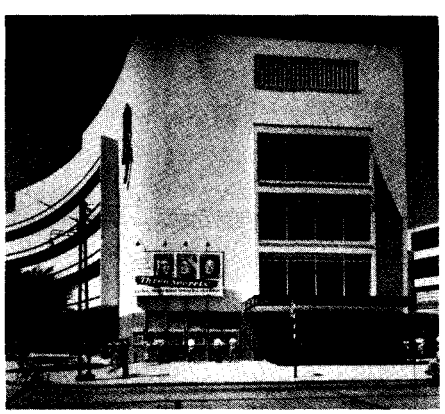
Wind direction was considered of primary importance in designing new housing, and architects put considerable effort into determining the proper orientation to ensure optimal ventilation. In Tel Aviv and its vicinity, pilotis became a common design feature; in fact, among Le Corbusier's five identifying features of the "new architecture," the piloti was the first to appear in Palestine, and its appearance, in Zeev Rechter's Engle House of 1933, marked the beginning of Le Corbusier's influence there. Rechter and his colleagues fought a long battle with Tel Aviv authorities to get permission to build on columns without having the open space underneath count as built area, which would be restricted by local regulations. Were all Tel Aviv buildings constructed on pilotis, the sea breeze would extend far inland, relieving the summer heat and humidity. In certain parts of Tel Aviv, construction on pilotis is now required by the city's master plan.

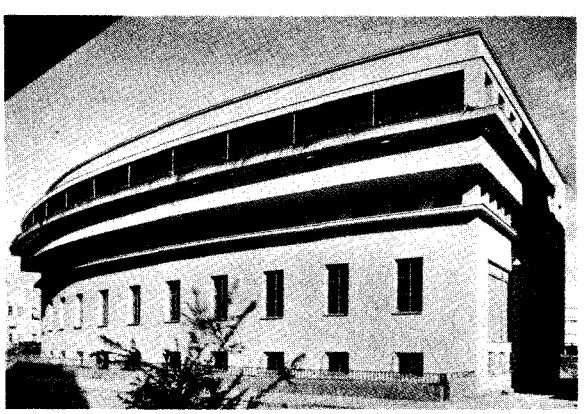
While the International Style in Europe was characterized by large glazed openings, the abundant light and heat of Palestine rendered large windows or glass screens unsuitable. The horizontal ribbon window, a distinguishing feature of the style, was often transformed into a balcony. In other cases, windows were not only reduced in size but recessed as well, and cantilevered projections were designed to shelter windows from winter rains and shade them from summer sun. While the climate discouraged extensive use of glass, fairly widespread use was made of glass block. Haifa architect Theodor Menkes displayed particular mastery in the use of this material. At his Glass House in Haifa (1938–41), glass block walls admit light into the apartments through the wall facing the common entrance corridor. The kitchens and bathrooms alongside the corridor are ventilated through apertures in the storage space in the ceiling. In Menkes's apartment house in Ahuza (1933–36), glass block enables daylight to penetrate from the ceiling through the stairwell, which is delineated by a transparent glass façade and a steel lattice.

Isaak Kalter



Isaak Kalter





Tel Aviv's Dizengoff Circle (top), designed in 1935 by Genia Averbouch, unified façades for residential and commercial buildings such as Arieh Sharon's Hen Cinema (above center) of the 1940s, and influenced nearby structures such as Joseph Neufeld's Kupat Holim building of 1937 (above right). Zeev Rechter's Engle House of 1933 (above left) was the first building on pilotis in Tel Aviv and the first evidence of Le Corbusier's influence in Israel.

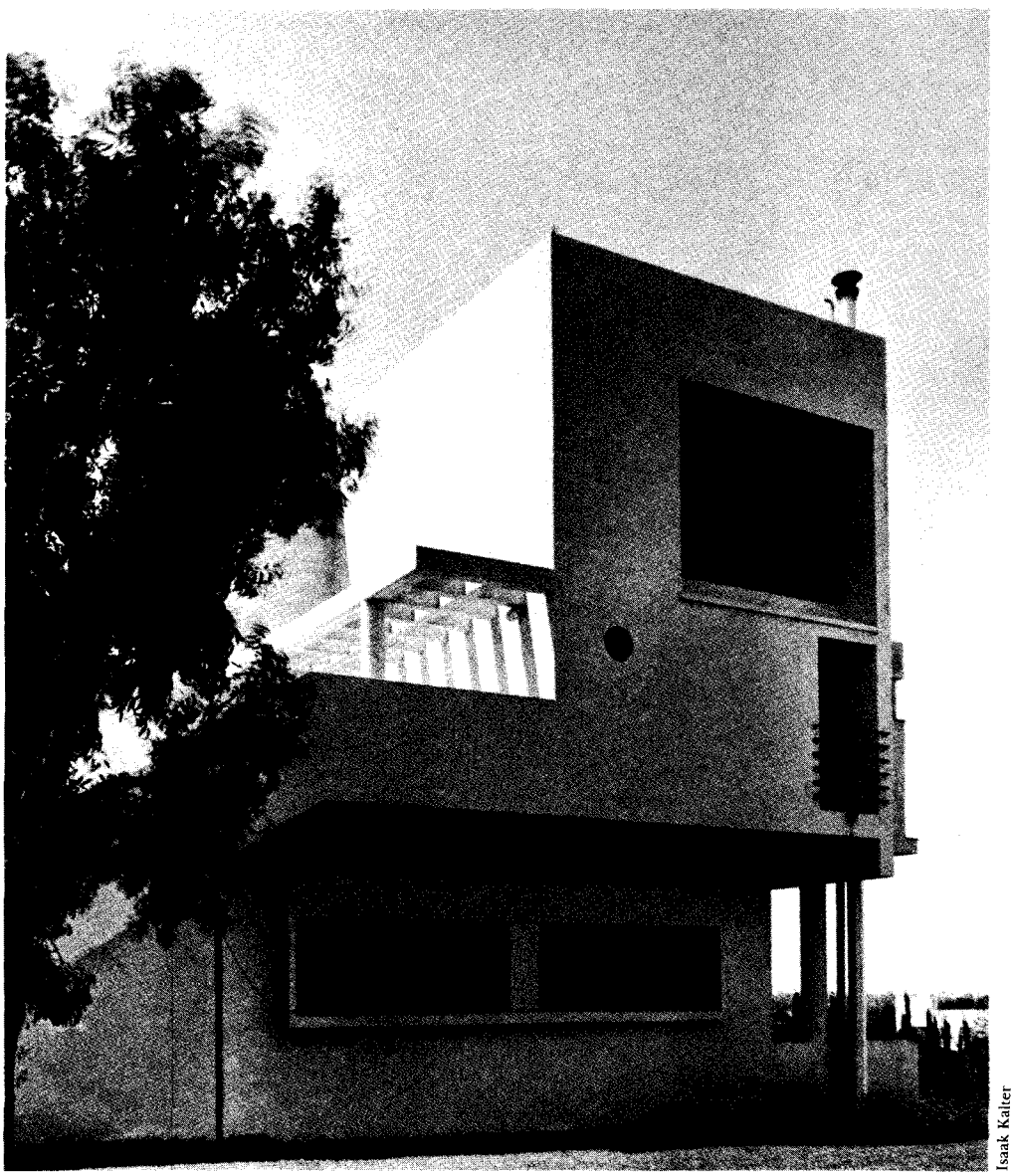
The stairs themselves are made of glass block—an unusual feature for the time.

Reinforced concrete, first adopted in 1912, was the most common modern building material used in Palestine. It suited the nonprogressive technologies and unskilled labor that characterized early construction, and its flexibility suited a wide variety of forms. Common filling materials were silicate brick or concrete block, generally coated with plaster and whitewash (sometimes tinted beige); later on, textured plaster was used. In Jerusalem and other places, where concrete frames were customarily faced with stone, certain International Style architects made a conscious effort to indicate that the stone was indeed used only as a cladding material. At Richard Kauffmann's Pomerantz House in Jerusalem (1931), the corners of the stairwell windows were left unfaced to expose the building's concrete frame. At the Hadassah Hospital in Jerusalem (1939), Mendelsohn placed the stones vertically to underscore their role as cladding.

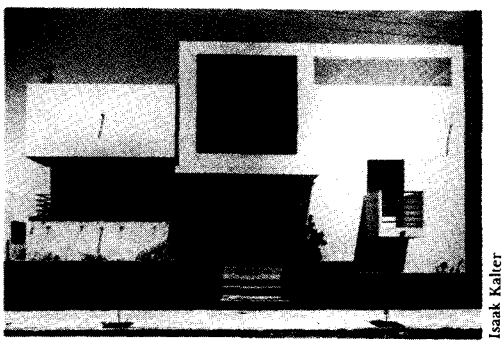
With the population in Palestine during the 1930s and 1940s limited in size, and distances between major cities relatively small, architects throughout the country were able to maintain close contact. However, even if architects did plan buildings outside their home cities, each city had its own style.

Waves of immigration and the resulting construction boom of the early 1930s increased the number of architects active in and around Tel Aviv, where construction was marked by a collective character. During the early 1930s, a circle of architects was founded in Tel Aviv by Arieh Sharon, Zeev Rechter, Dov Karmi, and Joseph Neufeld, and in 1935 the group began to publish a journal called *Habinyan Bamisrah Hakarov* (Construction in the Near East).

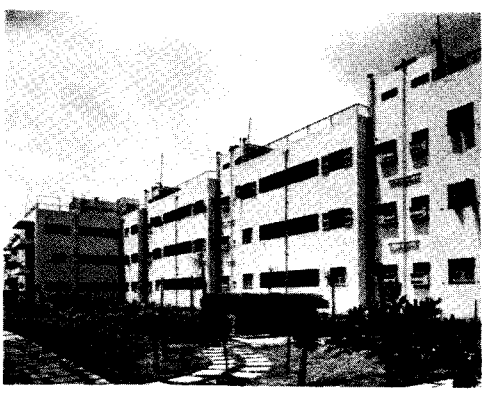
This original circle grew to include Shmuel Barkai, Benjamin Tchlenov, Yaacov Yarost, Robert Bennet, Israel Dicker, Carl Rubin, and others. In addition to exchanging personal views, this group also sought to bring Modern architecture to the attention of the government and Zionist authorities, as well as to the general public. The Association of Engineers and Architects instituted competitions, thus enabling young, unknown architects to build relatively large-scale projects. One of its most important achievements was in having architects included in the Tel Aviv Municipal Construction Committee. More than in any other city, various elements



Isaak Kalter



Isaak Kalter

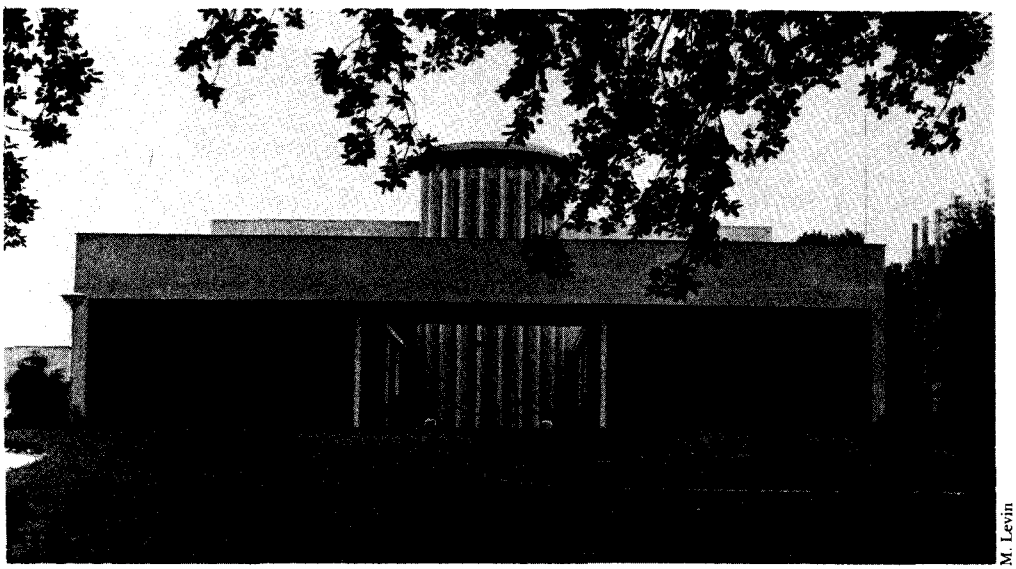


Leonardo Bezzola

Typical of Israeli residential architecture of the 1930s were two houses by Shmuel Barkai: the Lubin House, Ramat Gan, of 1937 (above left) and the Katz House, Tel Aviv, of 1935 (top right). Cooperative workers' housing, such as Joseph Neufeld and Israel Dicker's Residence G, Tel Aviv (center right), served as models for similar projects of the 1950s and 1960s, while in Jerusalem, Dov Kutchinsky's Residence B of 1934 (bottom right) turned inward on a communal garden.

Precursor: International Style in Israel

Architect Erich Mendelsohn practiced in Israel between 1934 and 1941, and the circular forms that distinguished his 1936 Weizmann Residence, Rehovot (top left and facing page, stair detail), and Schocken Library, Jerusalem (top right), of the same year, are found in the work of Israeli architects of the period, such as Leopold Krakauer's Teltch Hotel, Haifa, of 1934–35 (bottom), now the Bendori House rest home.



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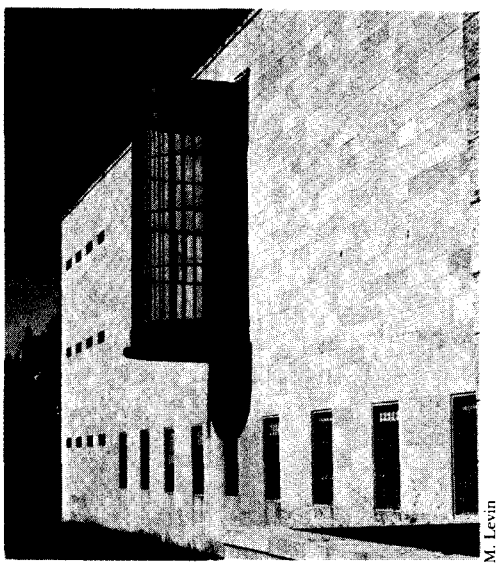

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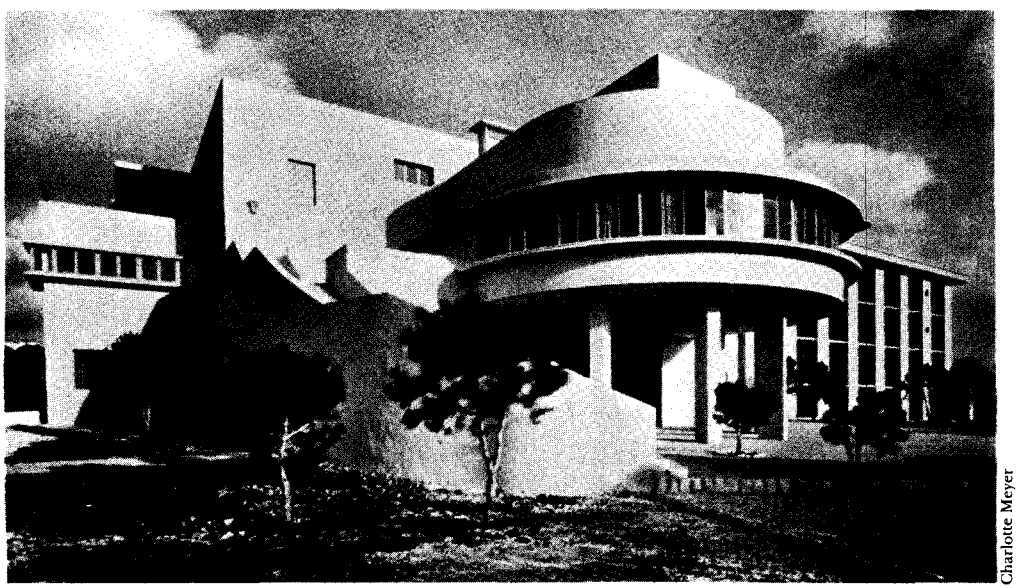


Charlotte Meyer

of construction, both formal and functional, became standardized in Tel Aviv, enabling engineers and contractors to adapt relatively easily to the International Style, although this led to a certain sterility in the standard house.

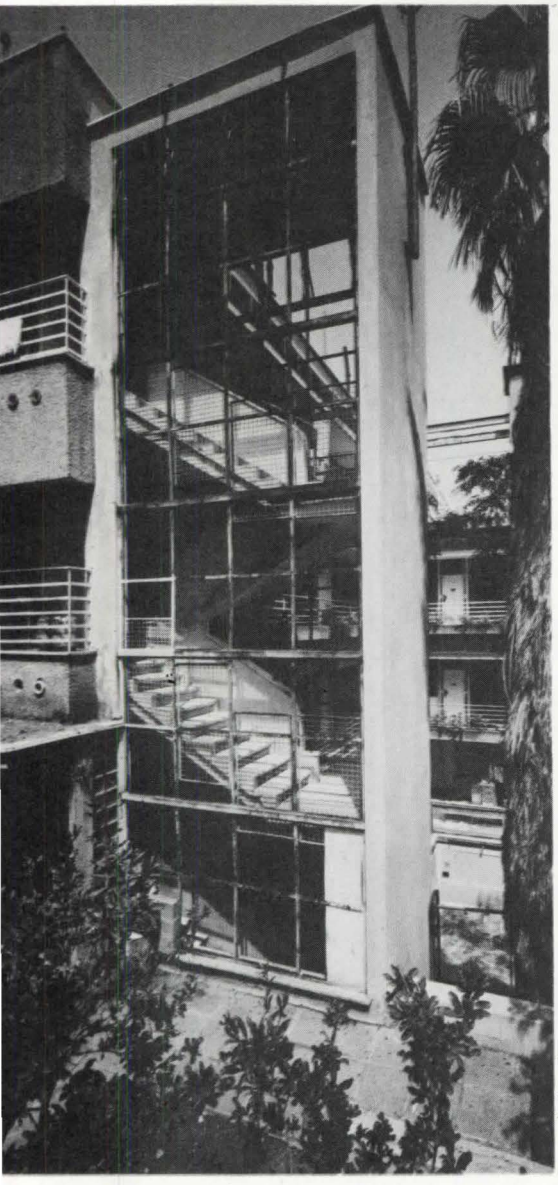
The cooperative housing of the 1930s in Tel Aviv served as the point of departure for the housing developments of the 1950s and 1960s. The Histadrut Housing Company believed that workers' residences, intended as a solution to high rents, must be based on the ideology of cooperative construction. Although monthly payments were no lower than average-high rents, they were applied to the eventual purchase of the flat. In addition to apartments, the complexes included kindergartens, clubs, grocery stores, assembly halls, and reading rooms (most of which are no longer standing).

Unlike their colleagues in Tel Aviv, Jerusalem architects could not ignore their city's historic tradition. Jerusalem was constructed gradually, neighborhood by neighborhood, from the time the Jews first ventured out beyond the Old City walls. Land availability problems precluded an urban continuum between the neighborhoods, some of which were also separated by cultural and religious barriers. The Mandatory Law demanding stone construction was designed to preserve the special character of the city, and the authorities were especially stringent about the area of the Old City (in more remote neighborhoods, however, concrete construction was allowed). As early as the 1920s, many capable architects, such as Richard Kauffmann, Leopold Krakauer, Dov Kutchinsky, Hecker-Yellin, Fritz Kornberg, Reuven Avram (Abramowicz), Zippora and Avraham Cherniak, and Dan and Rafael Ben-Dor, made their homes in Jerusalem. In 1933, they were joined by Heinz Rau and later by Erich Mendelsohn.

The neighborhood of Rehavia, Jerusalem's largest concentration of International Style architecture, was designed as a garden city, following Kauffmann's plans of 1922. Its first buildings, constructed in 1924–25, reveal an Oriental influence. The master plan allocated large plots, to give the neighborhood expansive gardens, and tree-lined streets in addition to the main garden axis. This greenery gave the neighborhood a rural character, despite its proximity to the center

Precursor: International Style in Israel

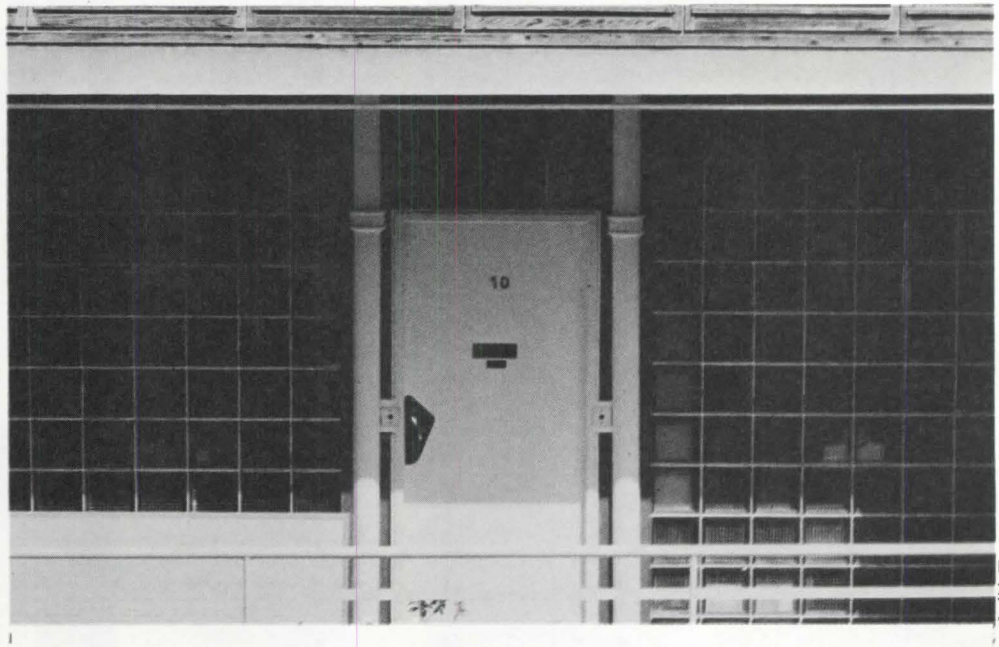
Glass block was used in buildings such as Theodor Menkes's Glass House, Haifa, of 1938–41 (below and right) to maintain privacy while admitting daylight to individual apartments through the walls that faced onto the open corridors. Menkes also used glass block for the ladderlike stair of his building at 11 Vitkin Street, Haifa, of 1933–36 (facing page).



Leonardo Bezzola

of town. In 1934, two cooperative complexes were built on the outskirts of Rehavia (unlike in Tel Aviv, where housing projects were located in the central city). Although Cooperative Workers' Residences A and B are not stone-faced, features peculiar to Jerusalem can be discerned nonetheless. Both projects are introverted, with inner courtyards that serve as focal points for social activity. At Residence A, planned by Zippora Neufeld-Cherniak and Avraham Cherniak, only two sections face the street, while the others are cut off from it. And while most apartments in Residence B, planned by Dov Kutchinsky, do indeed face the street, the complex remains essentially introverted; house entrances face a courtyard of lawns and plants.

In the 1920s, Haifa was a small city with a population of less than 30,000, most of it Jewish and concentrated in the lower city.



Judith Turner

Neighborhoods of apartment buildings and single-family housing were built in the spirit of the garden city. Topographical features also influenced construction: Commerce was concentrated in the lower city around the port, in shopping centers in Hadar Hacarmel and on Mount Carmel itself, while apartment buildings were constructed primarily along the slopes of Mount Carmel, with single-family dwellings on the mountaintop.

Many houses in the Carmel region were built in the International Style. The most important element of Krakauer's Teltch Hotel there (later the Megiddo Hotel and now the Bendori House, a Histadrut Fund Rest Home) is the circular wing on freestanding columns (since sealed up) at the ground-floor level. This circle is echoed in the external staircase leading to the dining room and the roof balcony above. The sculptural stairs and the circle of the dining wing are dynamic and powerful plastic elements: The first is traditionally Oriental, the second is modern European, and recalls the forms favored by Mendelsohn, who arrived in Palestine only after the hotel had already been planned. The guest wing includes balconies and a shading element on the roof that recalls the cantilevered canopy in Tony Garnier's vision of a Cité Industrielle (1901–04).

Le Corbusier believed that architects in Palestine should not limit themselves to functional planning and the International Style's vocabulary of forms. In a letter to the editors of *Habinyan,* he reacted to the journal's first issue of 1937 (dedicated to the International Style housing projects and cooperative apartment buildings in Palestine): "I am convinced that architecture in Palestine should not be limited solely to the discovery of one kind of formula; rather, one should seek the basic elements leading to architecture which is not only functional but also in keeping with the spirit of the time and of history. The problems encountered when confronting concrete and iron skeletons demand initiative, modesty and also respect for one's fellow man and for the sacred." ■

DR. MICHAEL LEVIN, *curator of the* White City *exhibition, is author of* White City: International Style Architecture in Israel/Portrait of an Era. *He currently serves as Art Advisor to the Mayor of Jerusalem and to* Ariel, *a monthly review of arts and letters in Israel.*

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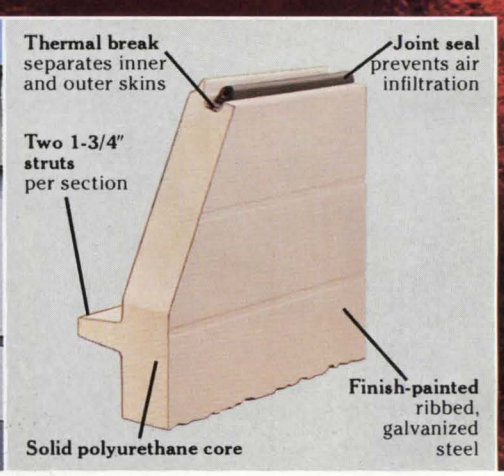

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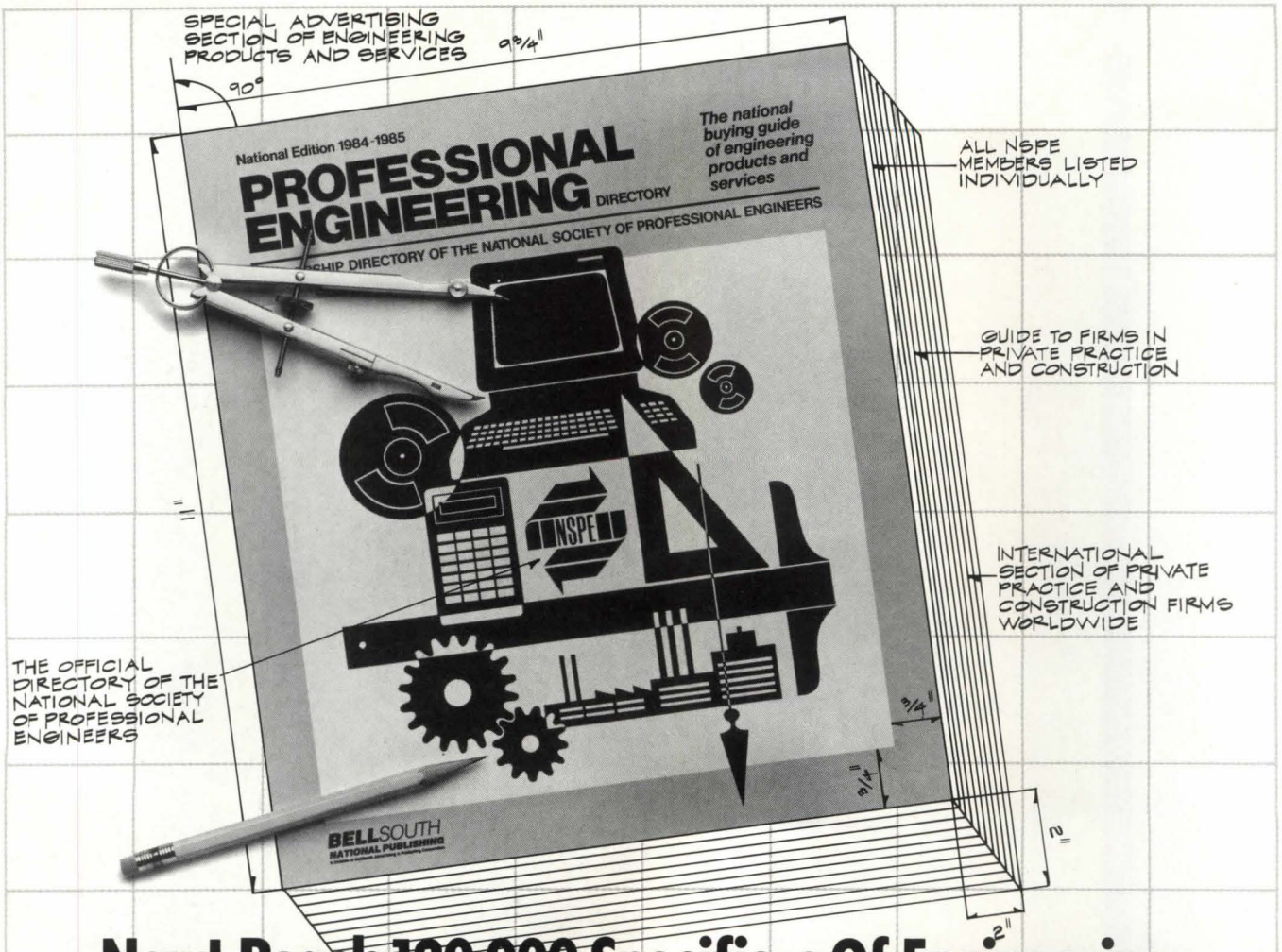

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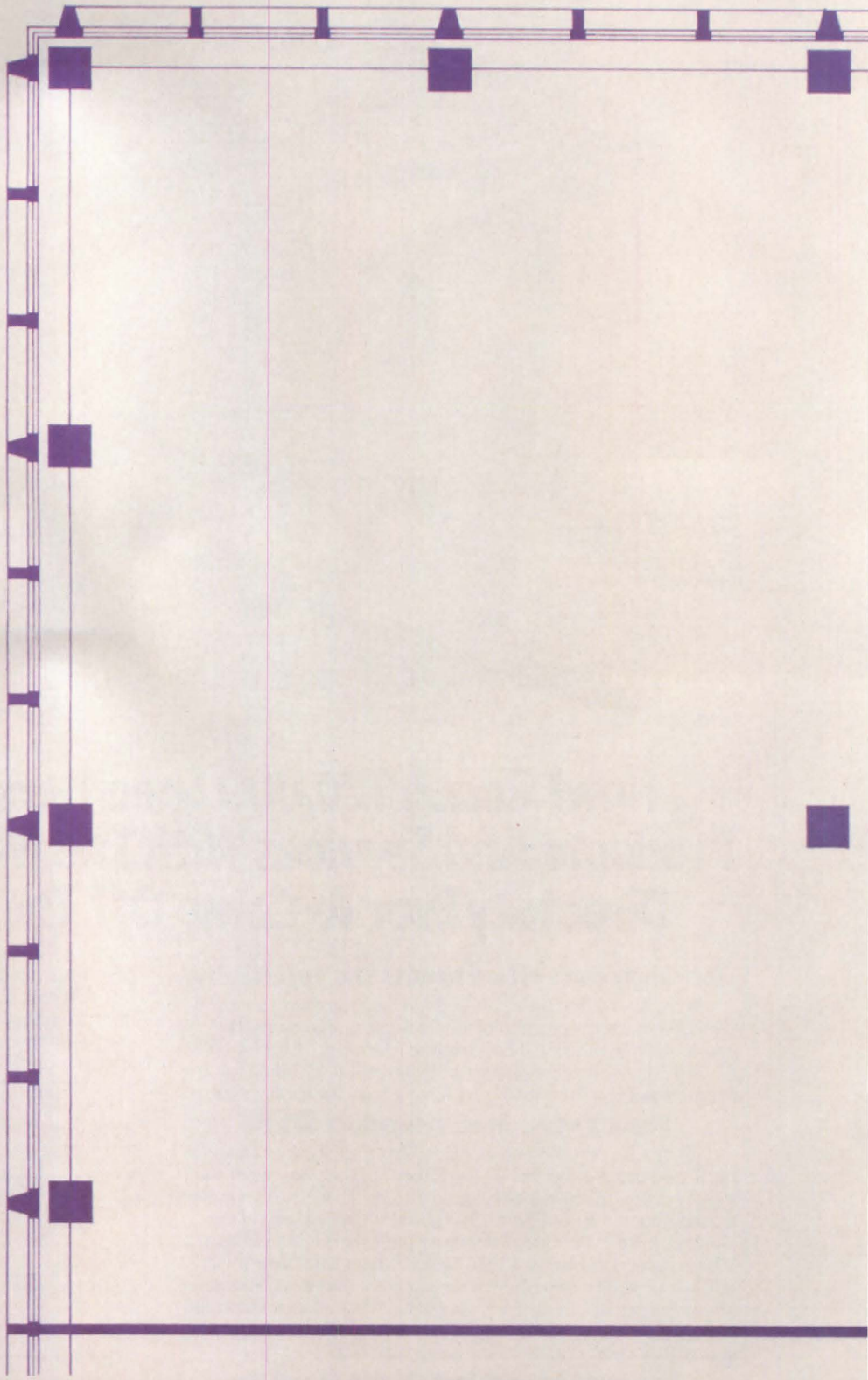

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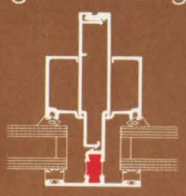

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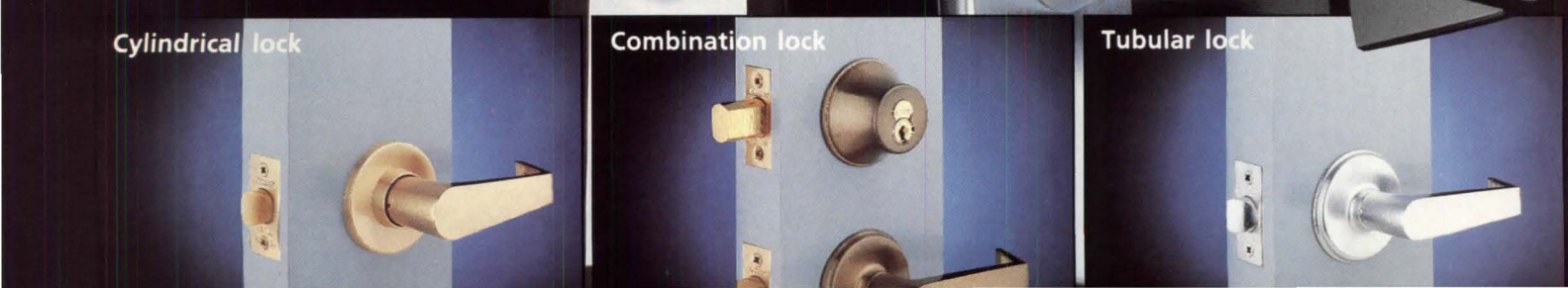


A prologue to paint

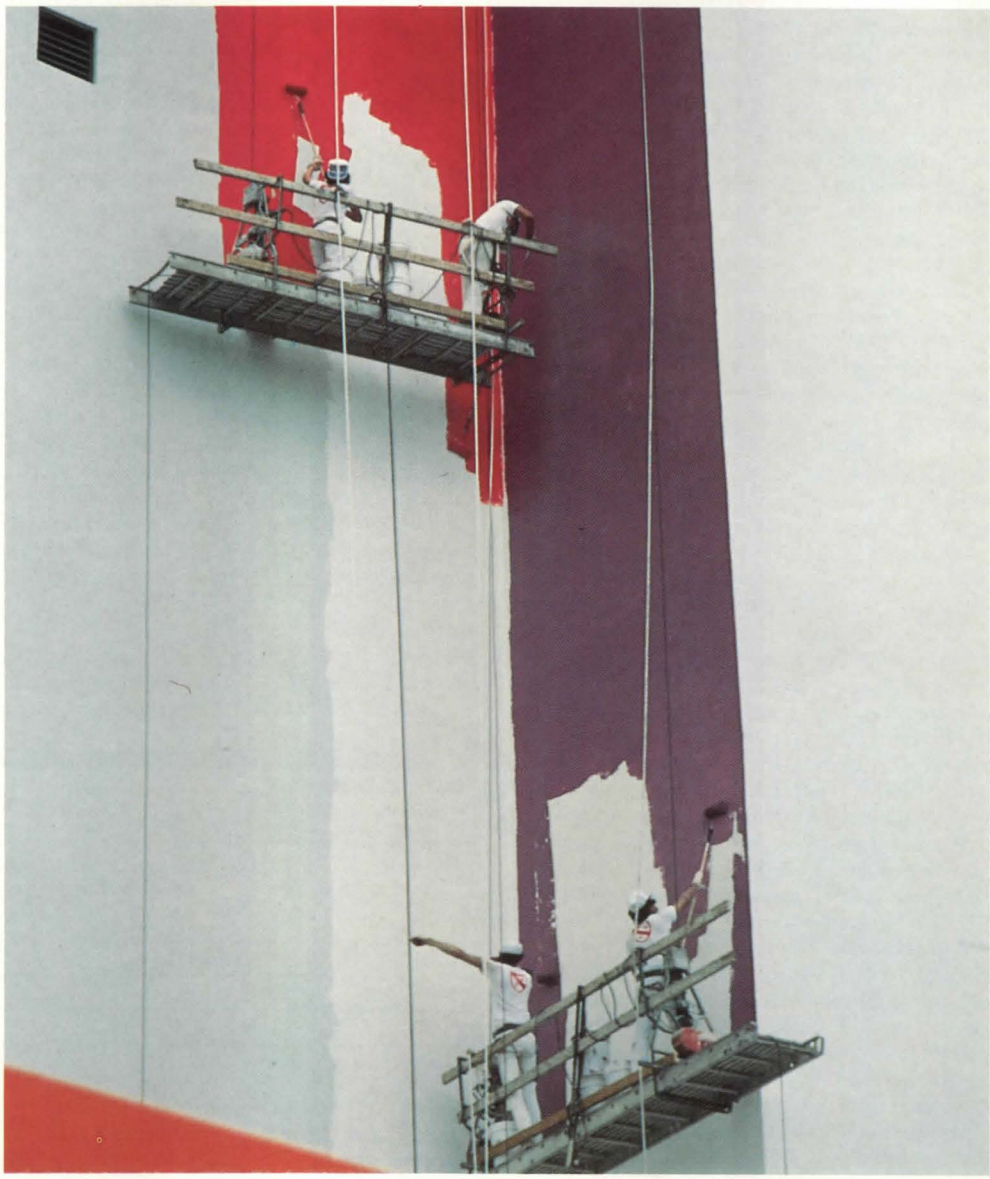
We can hide many things with a coat of paint; what we can't hide is a paint failure. Some paint failures are beneficial, for they indicate, like a skin rash, more serious problems beneath the surface. Most paint failures, though, indicate simply poor surface preparation, sloppy application, or improper paint selection. To achieve a good paint job, we can't ignore paint chemistry nor the basics of how to prepare for and apply a coat of paint.

The parts of paint

What constitutes paint? However much they differ in their detail, all paints have three basic components: crystalline pigments that lock together to give opacity and color; volatile thinners that enhance fluidity and penetration during application; and nonvolatile polymer resins that form the flexible film that holds the pigments and protects the surface. Variations in the amount and chemical makeup of those components account for the performance differences among paints.

When a coat of paint fails, the fault usually lies not with the paint but with the surface preparation or the paint's application. It's the first things that make a coat of paint last.

Modern coatings contain both highly complex synthetic pigments and pigments that date back to ancient times. Among the latter are chalk, an extender in oil, alkyd, and



Patricia Fisher

As the use of color on buildings has become more accepted (above), the chemistry of paint has become more sophisticated; the function of paint, more specialized; and the performance of paint, more dependent upon its proper application and proper surface preparation. Specifying the right paint for the right surface demands of the architect much care and attention—and even a little luck.

The table (below) lists the strengths and weaknesses of various types of paint. The solvent-based alkyds and oils and the water-based vinyls and acrylics may offer the best compromise between cost and performance, although the other, more expensive solvent-based paints offer better resistance to certain conditions. The diagrams (opposite page, below) indicate how latex paint forms a film through the coalescence of solid resin particles upon the evaporation of water, and how solvent-based paint forms a film through the oxidation and hardening of dissolved resins upon the evaporation of the solvents. The drawings on the far right illustrate the differences among gloss paint, which has more resin than pigment; semigloss paint, which has about an equal amount of both; and flat paint, which has more pigment than resin.

acrylic paint; lamp black, a fade-resistant carbon-based pigment; iron oxides, producing stable yellows, reds, and browns; and red lead, a rust-inhibitive pigment used in primers for iron and steel. Once common pigments that are now rarely used in paint include white lead, a highly refractive but toxic white pigment, and zinc white, a nontoxic white that tends to form soaps in reaction to oil. Titanium dioxide has largely replaced both as the standard white pigment and as the element that gives paint much of its durability and hiding power.

Synthetic pigments, developed in this century, have considerable fade-resistance and color variety. They also have more visual uniformity than earlier pigments that were hand ground and often impure. Some widely used synthetic pigments include vat yellows and copper phthalocyanine blues.

Pigments remain among the most expensive components of paint. Because of that, some paint manufacturers use less expensive extenders in lieu of pigments such as titanium dioxide. Some claim that those extenders can improve adhesion, ease sanding, and increase the strength of the paint film if the extender particles are properly "packed," but other manufacturers argue that pigment extenders, common in most low-cost paint, reduce its durability and hiding ability.

Plastic pigments promise to reduce the amount of titanium dioxide in paint without reducing its performance. Those pigments work by entrapping air within microscopic polymer beads. While some companies seem skeptical of the long term performance of plastic pigments, others think that those polymers will largely, although not completely, replace titanium dioxide in paints.

Invisible and volatile

The volatile component of paint consists of either petroleum-based organic solvents or water. In the solvent-based paints, manufacturers dissolve the resins and pigments in a solvent solution. In the water-based paints, they disperse the resin and pigment particles in a water emulsion. As the organic solvents evaporate upon the paint's application, the dissolved resins oxidize and harden into a paint film; as the water evaporates, the dispersed but still solid resin particles coalesce into a paint film.

Solvent-based paints have come under increasing governmental regulation because the organic solvents that they give off are considered pollutants and a health hazard. California, with the strictest regulations, has made the use of solvent-based paints difficult for many architectural applications. While almost everyone in the paint industry agrees that solvent-based paints have certain performance advantages, many paint manufacturers concede that solvent-based coatings may go the way of white lead pigments.

Rating resins

The most significant performance difference among paints rests not with their pigments or volatile thinners, but with their film-forming resins. For centuries, the natural polymer linseed oil, squeezed from the seeds of the flax plant, served as the primary resin in solvent-based paint. While reliable, linseed oil dries slowly, forms a fairly soft film, and tends to yellow over time. Alkyd resins, synthesized from the fatty acids in vegetable oils with alcohols such as glycerine, have largely replaced linseed oil in solvent-based paint because of their faster drying, tougher film and better color retention. Alkyds also have superior wetting properties and compatibility with most corrosion-inhibiting pigments. They have their limits though. Alkyd paints may deteriorate when in contact with acids, solvents, or alkaline surfaces such as fresh concrete, or when placed over a permeable surface with a strong vapor drive.

Other solvent-based resins, while less common than alkyds, address a wide range of specialized needs. The closest chemically to alkyds are the silicone alkyd resins. They have excellent heat resistance, although they must have at least 25 percent silicone.

Two-part epoxy resins have excellent chemical and abrasion resistance, and adhesion to contaminant-free surfaces, but have

SOLVENT-BASED RESINS								**WATER-BASED RESINS**
Use For	**Alkyd**	**Vinyl**	**2-Part Epoxy**	**Oil**	**Phenolic**	**Rubber Base**	**Moisture-Cure Urethane**	**Vinyl or Acrylic**
Adhesion	VG	F	E	VG	G	G	G	G
Hardness	G	G	VG	F	VG	VG	E	G
Flexibility	G	E	E	G	G	G	VG	E
Resistance to:								
Abrasion	G	VG	VG	F	VG	G	E	G
Acid	F	E	G	P	VG	VG	E	G
Alkali	F	E	E	P	G	VG	VG	G
Detergent	F	E	E	F	VG	VG	VG	G
Heat	G	P	G	F	G	VG	G	G
Strong Solvents	F	F	E	P	VG	F	E	G
Water	G	E	G	G	E	VG	VG	F
Wood	G	NR	G	G	G	NR	G	E
Fresh, dry concrete	NR	VG	VG	NR	NR	VG	G	E
Metal	VG	VG	VG	VG	VG	G	G	NR
Interior	G	G	G	G	G	G	G	E
Exterior								
Rural	G	VG	G	G	G	G	G	E
Seashore	G	E	VG	G	VG	VG	VG	F
Industrial areas	F	E	E	VG	VG	VG	VG	NR
Fade resistance	VG	E	G	G	G	G	F	E
Chalk resistance	G	E	F	G	G	G	F	G

Key: E-Excellent, VG-Very Good, G-Good, F-Fair, P-Poor, NR-Not Recommended

Source: David Litter Laboratories. Adapted from tables in *The Paintings and Coatings Handbook* by Abel Banov.

poor gloss retention outdoors and a limited pot-life. Manufacturers have developed one-part epoxy esters that have no pot-life limitations, although those paints are not as hard or as chemically resistant as two-part epoxies.

Aromatic urethanes, like epoxies, have good abrasion and chemical resistance but they tend to chalk outdoors and not hold light colors. Aliphatic urethanes have largely overcome those drawbacks. Equally hard and resistant to abrasion and chemicals are moisture-cured urethanes, although they require a relative humidity between 30 and 90 percent to cure, and catalyzed polyurethanes, which require field mixing of their two-part resin.

Chlorinated rubber resins resist water, acids, and alkalis, but they have little resistance to aromatic solvents or temperatures above 150 F. Among the other rubber-based resins, vinyl toluene-butadiene functions well as a waterproof coating, and styrene acrylate copolymer as the basis for texture paints.

Zinc-rich resins serve primarily in corrosion-resistant coatings, although they must have from 75 to 95 percent zinc content to be effective. The organic zinc-rich primers have better chemical resistance and adhesion; the inorganic types, better resistance to abrasion, heat, and solvents.

Phenolic resins are used in aluminum paint, as topcoats for metals in humid environments, and as primers for surfaces in contact with fresh water. A disadvantage lies in their tendency to darken. A common metal finish with good chemical resistance is paint containing vinyl resins; those resins dry so rapidly, though, that they usually require spray application in a factory.

Contrary to the many distinctions that we make among solvent-based resins, we make very few such distinctions among those that are water-based. The term latex usually applies to them all, regardless of their chemical differences and regardless of the fact that the synthetic rubber resin (styrene-butadiene) first used in the formulation of latex paints is now rarely used in architectural applications. Latex paint entered the market in 1948. A long line of water-based paints preceded them, though, including whitewash, consisting of lime and water, and distemper paints, consisting of pigments bound in a water-soluble protein glue.

The advantage of latex paint rests with its hardness, flexibility, gloss retention, easy cleanup, little odor, low toxicity, permeability, and rapid drying. Where latex paints have a slight disadvantage is in applications with an ambient temperature below 50 F (the water in it can freeze) or over old oil paint (the greater flexibility of the latex paint can pull off the more brittle oil paint). The latter problem has become quite common as more people, when repainting, switch to latex without first covering the old oil paint with an oil or alkyd primer.

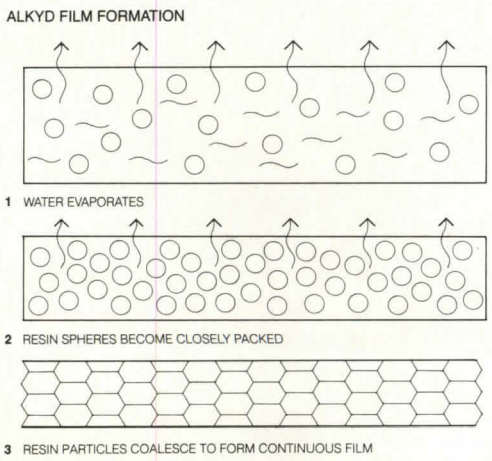
Largely replacing the original synthetic rubber resin in water-based paint are polyvinyl acetate and acrylic resins. The polyvinyl acetate resin costs less although it produces a somewhat softer film. The acrylic resin, for its extra cost, produces a better enamel and has better resistance to alkali and greater adhesion to surfaces such as yellow pine with its high coefficient of expansion.

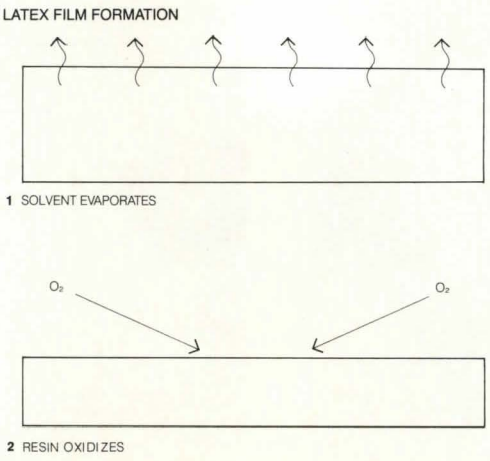
The prepared surface

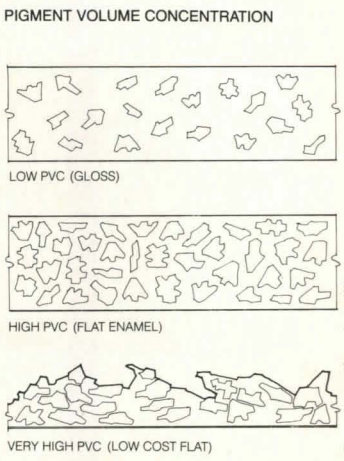
Analysts estimate that less than 20 percent of all paint failures stem from the product itself, with most of those the result of using inexpensive or poor quality paint. The remaining 80 percent of the failures stem largely from what is—and is not—done to the surface before the paint ever reaches it. Acknowledging the importance of good surface preparation is one thing, achieving it is another. With so many different kinds and conditions of materials and with full-time supervision of those preparing a surface difficult, specifying the means and desired results of surface preparation becomes that much more critical.

The proper preparation of an uncoated surface differs greatly from that of a surface already painted. Among the former, steel no doubt ranks among the most taxing. Its preparation must not only remove dirt, grease, and oil, but remove rust and mill scale—oxide films that have poor adhesion to the steel surface. Cleaning unpainted steel with petroleum-based solvents, alkalis, emulsifiers, or steam removes the dirt, oil, and grease, but has little effect on the rust and mill scale. The solvents, especially, also present a fire and health hazard. Hand-tool or power-tool cleaning that scrapes, sands, brushes, or grinds loose rust or mill scale from the surface leaves intact the oil and grease as well as firmly adhered oxides.

To clean steel thoroughly requires abrasive cleaning. The Steel Structures Painting Council has established performance standards for abrasive cleaning that range from brush-off blasting that exposes "flecks" of clean metal, to commercial blasting that leaves only a slight residue of contaminants over no more than a third of the surface, to near-white blasting that leaves 95 percent of the surface contaminant-free, to white metal blasting that eliminates all visible contaminants. The cost of preparation and the adhesion of the paint coat increase accordingly. Other means of cleaning steel, such as popping the mill scale off by exposing the steel to an oxyacetylene flame (called flame cleaning) or immersing the steel in an acid bath in the factory (called pickling) are usually less effective than blasting. Unpainted steel also benefits from pretreatment. That includes galvanizing the steel or immersing it in a bath of acid phosphate salts (called a cold phos-







Drawings: Sherwin Williams

phate treatment, or when the salts are heated to around 140 F, a hot phosphate treatment).

To hold paint to metals such as stainless steel and aluminum often requires wash primers of cold phosphoric acid, chromate treatments that involve dipping the metal in a solution of sodium chromate and sodium carbonate, or Alodine Process treatments that replace the sodium solution with one containing chromic, phosphoric, and hydrofluoric acid. Contaminants on aluminum also can be removed by steam cleaning.

Unlike steel, which must be coated quickly to prevent its oxidation, concrete accepts a coat of paint best when let to weather a year or two. Since construction schedules rarely allow that, the concrete should at least cure for 30 days at a surface temperature of 75 F, emit a minimum of water vapor, and have a smooth surface with a minimum surface temperature of 55 F at least one day prior to painting. Washes of phosphoric acid and zinc chloride will neutralize any excessive alkalinity. With those conditions attained, the dirt, grease, and form-release agents can be removed with detergents, steam cleaning, or solvents and any efflorescence, laitance, and loose cement, with hand scrapers or wire brushes. Holes just under the surface should be opened and patched with a patching compound compatible with the paint coat.

To prepare smooth concrete for painting requires abrasive blasting or acid etching. For acid etching, first wet the surface, then scrub on a solution of phosphoric acid (50 percent by weight) or a solution of muriatic acid (5 to 15 percent by weight depending upon the amount of surface laitance). Apply those solutions at the rate of about 50 to 75 square feet per gallon. Allow them to stand on the surface no more than five minutes, scrub the concrete and rinse off the solution with clean water to prevent the formation of salts.

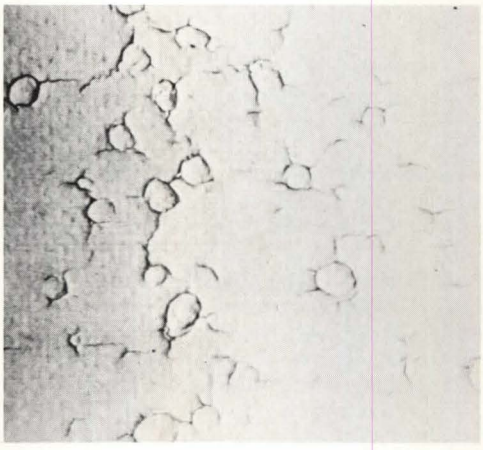
While none of the standards for the abrasive blasting of steel exist for concrete, that technique should have sufficient force to open air pockets near the concrete's surface (allowing their subsequent filling, particularly important with surfaces exposed to water or constant abrasion) and to roughen the concrete to about the texture of medium grit sandpaper (providing a mechanical key for the paint). In all cases, remove any dust from the surface before painting. Acid etching and abrasive blasting will remove any glaze that develops on the concrete surface, as will a solution of 3 percent zinc chloride and 2 percent phosphoric acid applied to the glazed concrete and let to dry. Sack coating, with cement, sand, and mortar hand-rubbed onto the concrete surface, also provides a surface suitable for painting, although it can accommodate only thin, flexible coatings. Thick layers of paint can pull the sack coat off the concrete.

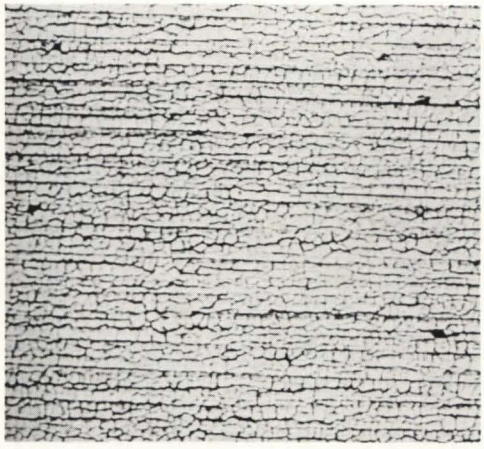
Other cemetitious materials have fewer preparation requirements. Cement block, once cleaned of dirt and dust, should have its pores filled with a polyester, epoxy, or synthetic rubber filler and any grease removed with solvents. Brick, ideally, should weather for a year to allow any soluble salts to migrate to the surface and be removed by hand brushing.

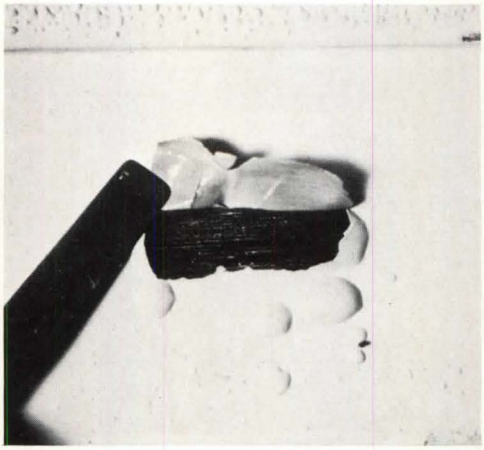
Since most wood surfaces take paint well, the major preparation involves filling all nail holes or checks; scraping, sanding, and spot priming all knots and pitch streaks; and removing any dirt or dust. Painting wet wood or painting at a temperature below 50 F can jeopardize the coating.

Reviewing old film

Preparing a surface already painted can entail both far less and far more work than that for new surfaces, depending upon the thickness of the old paint and how well it has adhered to the original surface. If the paint is no thicker than about 1/16th inch and has good adhesion, preparation for repainting poses few demands. Hosing with water will remove dirt and dust, hand sanding will roughen glossy areas, scrubbing with a solution of ½ cup detergent in one gallon of water will remove surface chalking, and







Photos: Sherwin Williams

Photos: Mt. Vernon Ladies Association

The photographs (left) show some of the most common paint failures—alligatoring (above right) due to too much paint on the surface; cracking (above left) due to the paint and the surface having different rates of expansion and contraction; blistering (below left) due to trapped solvents when a paint is applied in the sun; and peeling (below right) due to moisture migration, improper surface preparation, or paint incompatibility.

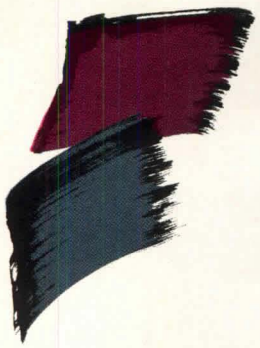
The recent repainting of Mount Vernon's interiors (above) reveals the richness of the original colors. Paint analysts can now account for the fading of pigments or the yellowing of oils and varnishes with much greater accuracy—allowing us to see historic structures, for the first time, in their true color.

scrubbing with the same proportions of bleach and water (plus increasing the amount of light and air and adding a fungicide to the new paint) will eliminate mold and mildew.

If the paint has become too brittle or too thick, surface crazing will occur first, then deep cracking and alligatoring. That usually demands removing the paint in affected areas. Electric heat plates or heat guns remove paint quickly without volatilizing the lead in paint, but they can char a wood surface or ignite dust in a wall. Paint strippers eliminate that hazard, but they have their own drawbacks. Methylene chloride strippers work slowly and pose a flammability and toxicity hazard, while caustic strippers can raise the grain in wood, deposit salts in a wall, or leave a residue incompatible with oil paint.

Most paint failures result in peeling or blistering. The cause may lie with premature solvent evaporation, poor surface preparation or paint incompatibility if the blisters expose previous paint, or moisture migrating out of the building if they expose the bare surface. Scraping and sanding the surface will remedy the problems of solvent evaporation or poor preparation. The addition of an oil or alkyd primer over the sanded surface will remedy any paint incompatibility. Rectifying a moisture problem demands more extensive repairs, because the source of the water vapor—open joints at flashing or around doors and windows, breaks in the vapor barrier, poor interior ventilation, leaking plumbing—must be eliminated before scraping, sanding, and repainting.

The types of paint failures don't end there. The paint film will wrinkle if it's applied too thickly or before the primer coat has dried, requiring the scraping and sanding of the surface. When the paint film becomes soft and oozes a brown liquid, alkalis on the surface might have attacked the oils in oil or



alkyd paint, requiring the removal of the paint and the application of an alkali-resistant primer. Most alkyd paints suffer from blooming, a bluish-white haze produced when water droplets from high humidity or fog condense on the paint before it dries. The solution to that involves removing the paint, switching to a water-based paint, and not painting during humid conditions. Rusting fasteners or resinous streaks in wood also can stain a paint film. The former demands removing the paint and applying a rust-inhibiting primer; the latter, scrubbing the surface with a solution of equal parts of denatured alcohol and water and applying a stain-blocking primer.

Accepting applications

Insuring the proper application of paint depends, as much as anything, on securing an experienced and reputable contractor. It pays, nevertheless, to list application parameters in the painting specifications—parameters such as not painting in temperatures below 50 F or above 90 F, in wind velocities above 15 mph, in relative humidities above 80 percent, or in the direct sun. The specifications also should spell out open container temperatures (between 65 and 85 F) and application rates (allowing each coat to dry prior to recoating).

The methods of applying paint, unchanged for centuries, have undergone dramatic changes in the past few decades with the advent of paint spraying. Brushing paint still has advantages when applying primers, when covering small areas and intricate detail, or when replicating the visual qualities of historic paints. The same goes for rolling paint, when covering large, flat areas where its stippled texture doesn't matter and where spray painting would require too much masking or pose a hazard. But spraying paint greatly increases the speed of application and, with skilled people, produces more uniform results.

The first spray guns atomized the paint with compressed air, coating a surface with a diffuse fog. While still commonly used, air spraying wastes paint and requires considerable masking of adjacent surfaces and, occasionally, breathing apparatus because of the abundant overspray. Air sprays also can create runs and drips in the paint because of moisture entrained in the compressed air. Those problems led to the development of the airless spray, which uses hydraulic pressure rather than compressed air to create a much faster and more direct stream of atomized paint, and the electrostatic spray, which uses hydraulic pressure and electrostatically charged paint. The airless spray gun improves coverage, doubles the application rate, and greatly reduces the overspraying of air spray guns, although it can clog more easily and cannot be used, for instance, with fibrous materials. The electrostatic spray has less overspray and more uniform coverage than either of the other two methods. Its disadvantages lie with the high cost of the equipment and servicing, the need for special paint formulations, and its applicability only to bare metal.

Blaming paint

Paint not only hides a surface; it disguises its own complexity. What other materials have the ability to go from a liquid to a solid state by simply brushing (an experimental solid paint not yet available in this country goes from one solid state to another when rubbed); the ability to adhere to most (clean) surfaces; and the ability to retain its color and integrity as a film despite exposure to the harshest environments? Because paint is so familiar and appears so simple a material, it's easy for us to blame it for any paint failures. But most paint failures come from our own failure to understand and to communicate the material's real complexity. That understanding may not require a detailed knowledge of paint chemistry, but it does require some familiarity with—and humility before—a material whose range of performance capabilities makes it one of the chemical wonders of this century. [THOMAS FISHER] ■

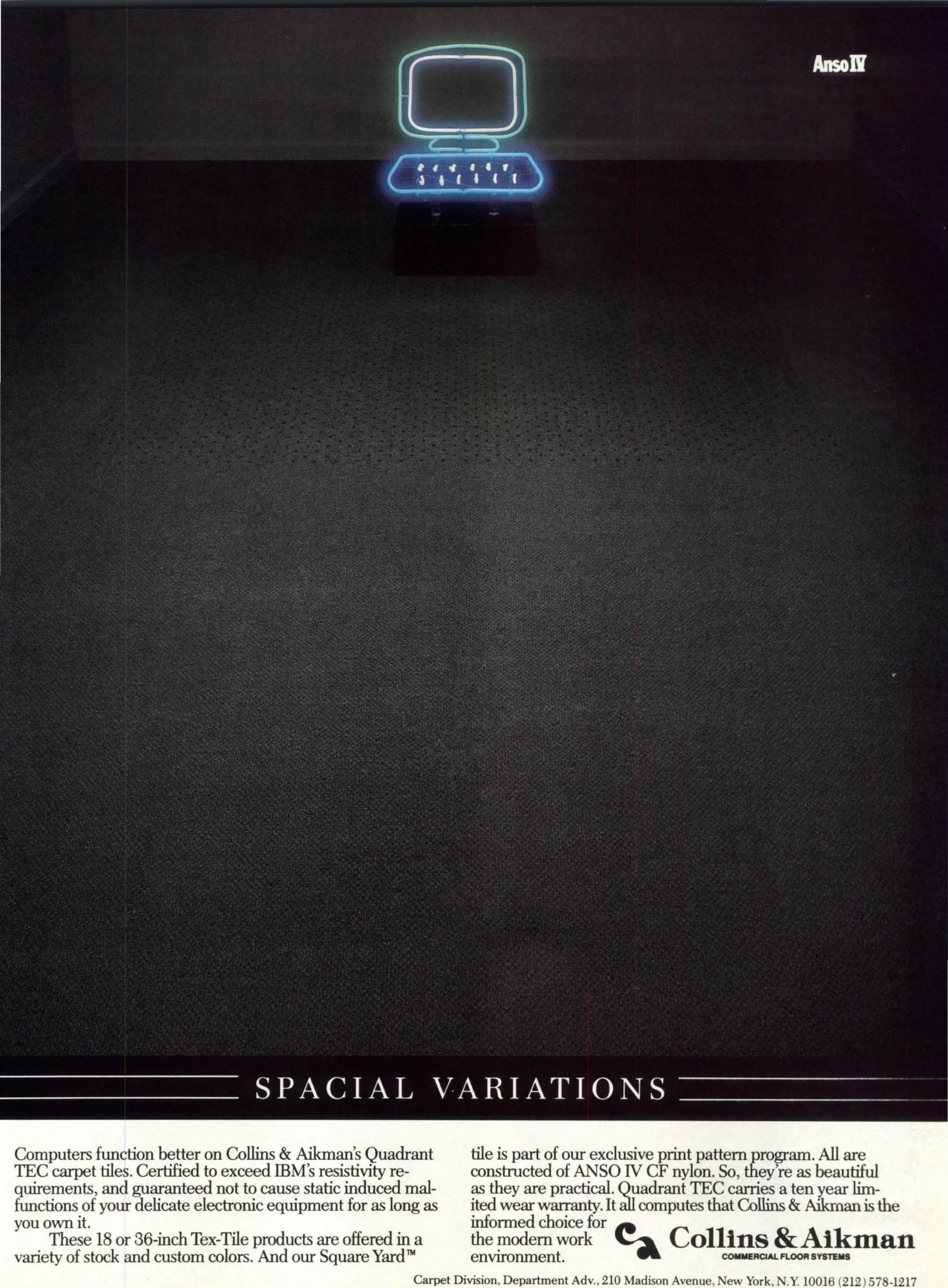
Acknowledgments

We would like to thank the following people for their contributions to this article: Robert Martin, Maureen Fitzgerald, Alan Blanchard, David Mahowald, Cathy Pokorny, Sherwin-Williams; Ann Dail, James Bennis, James Bednarik, Gerald Amato, James Sainsbury, Glidden; Wendy McAfoose, PPG; Maurice Denton, Devoe and Raynolds; Sara B. Chase, Society for the Preservation of New England Antiquities; Frank Welsh, Historic Paint Color Consultant; Thomas Kocis, Federation of Societies for Coatings Technologies; Janet Eackloff, National Paint and Coatings Association; Alan Pfenniger, Flood Company; Jeanne Martin, Fuller-O'Brien; Carol Stein, Mobay.

Further reading

The *Paints and Coatings Handbook* by Abel Banov (Structures Publishing Company, Farmington, Mich., 1973) and the Department of Commerce publication *Organic Coatings, Properties, Selection, and Use* by Aaron Gene Roberts (available through the National Technical Information Service, Springfield, Va, 703-487-4780) serve as excellent general references. The book *Hess's Paint Film Defects, Their Causes and Cures,* edited by H.R. Hamburg and W.M. Morgans (John Wiley & Sons, Halsted Press) remains the most encyclopedic account of paint failures, while "Preservation Brief 10: Exterior Paint Problems on Historic Woodwork" by Kay D. Weeks and David W. Look, AIA (Technical Preservation Services Division, National Park Service) looks at paint failures in relation to historic structures.

Refer to p. 164 for product information related to paint.



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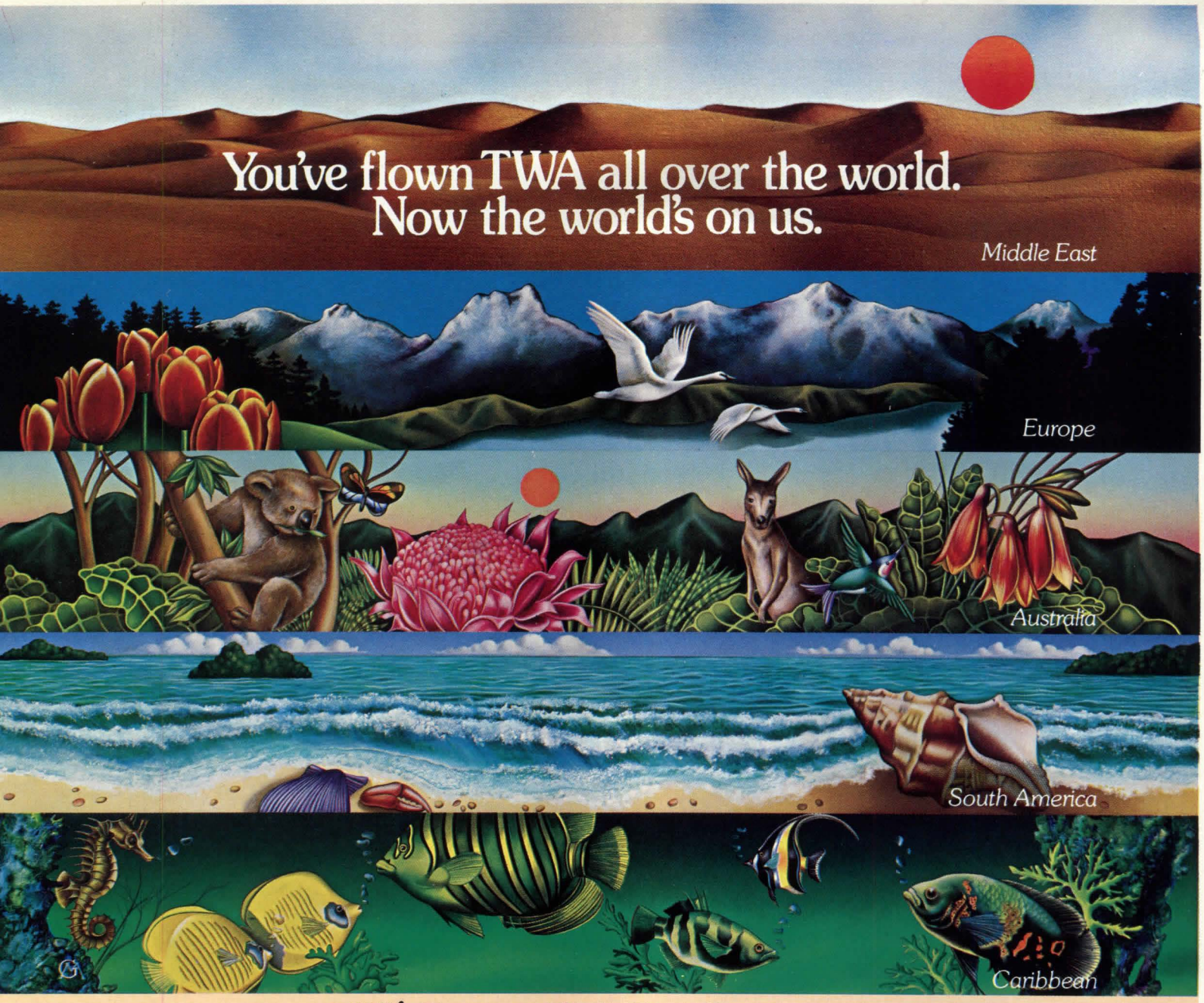

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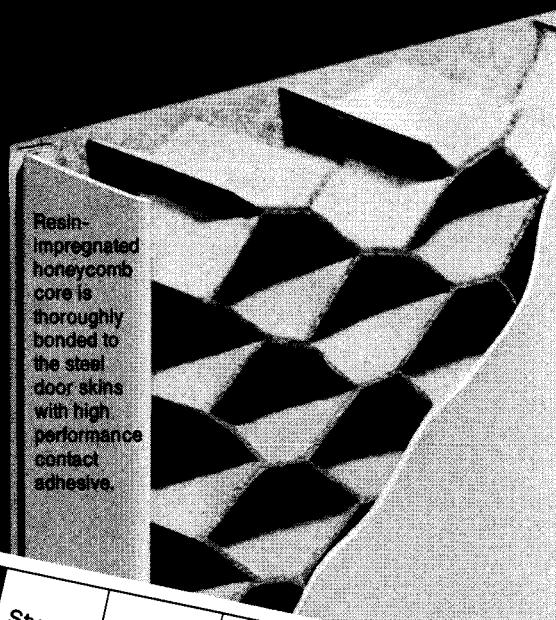

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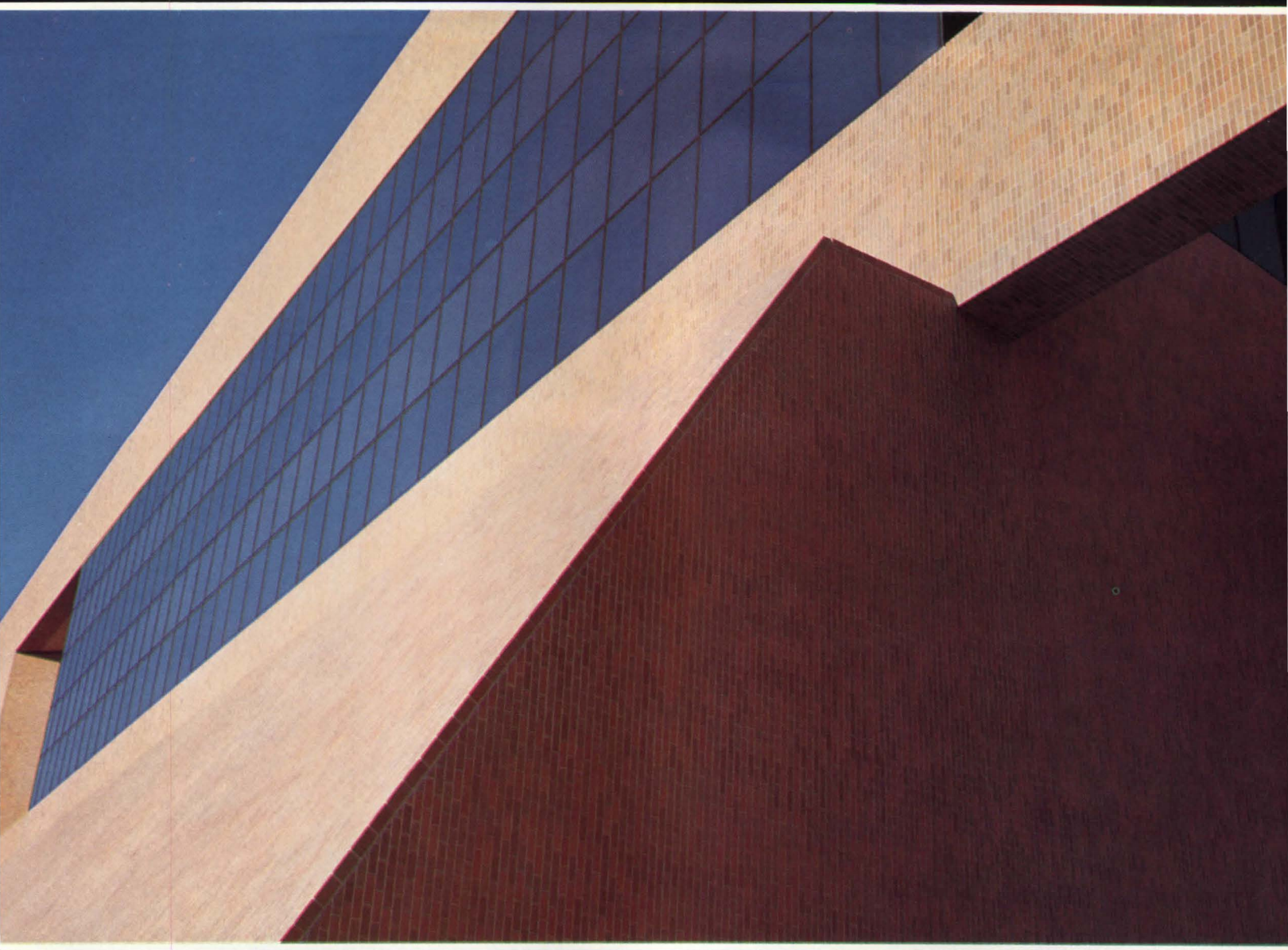

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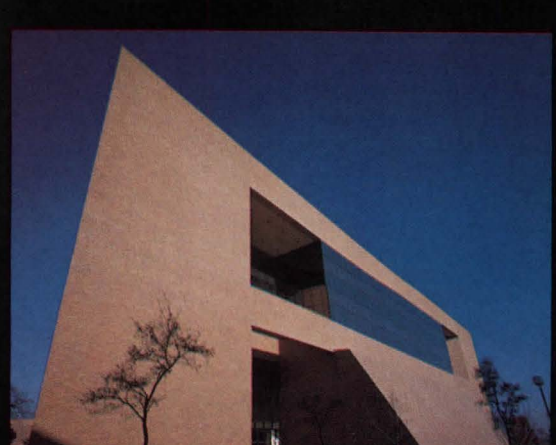

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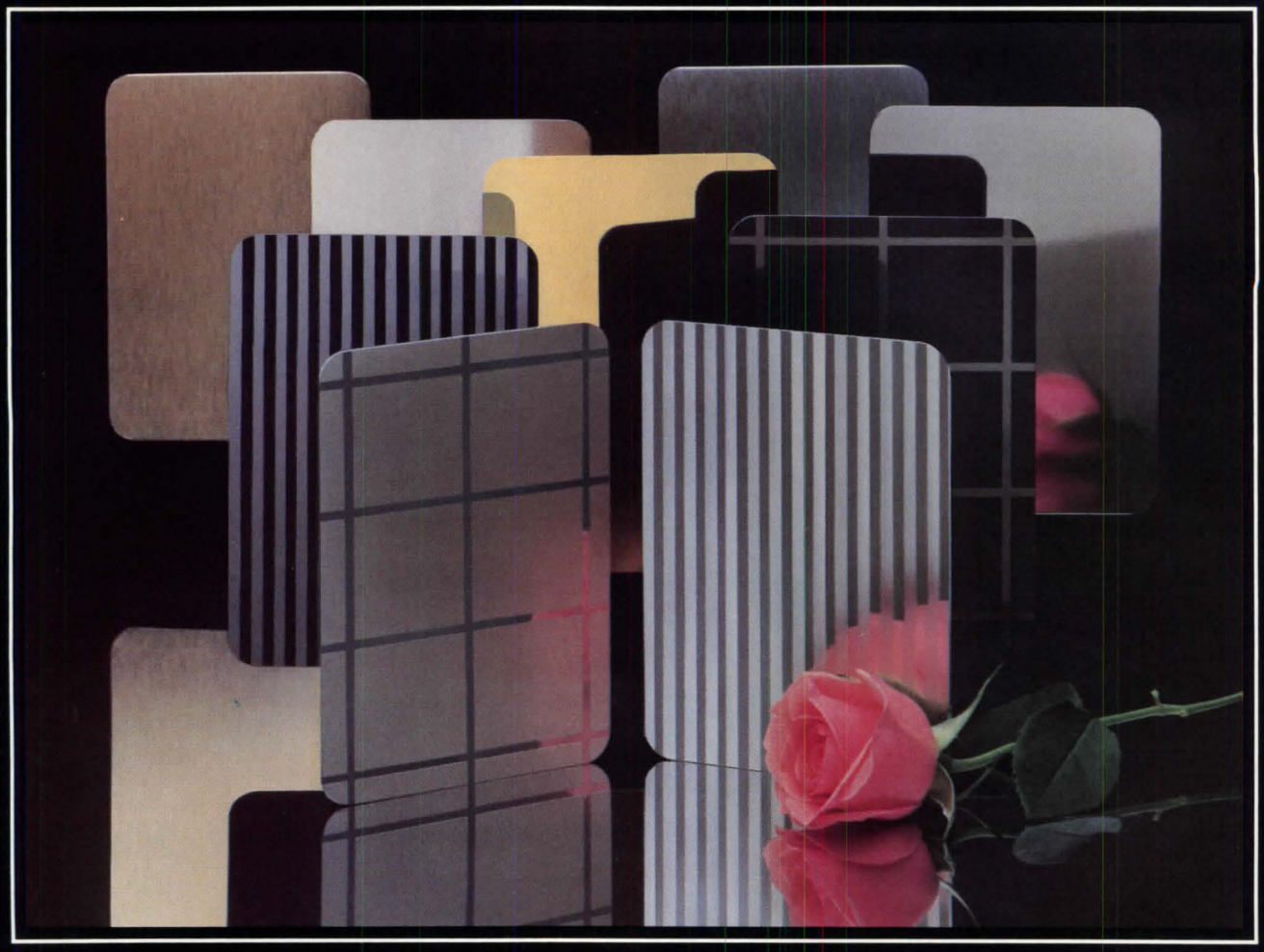

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WINNING PROJECTS will be published in the May 1985 P/A and they will be displayed at major industry events during the year. Winners will be honored in New York City at an awards ceremony in early March attended by press, designers, and industry manufacturers.

In addition to the exposure afforded the submissions, the competition will encourage further discourse between the entrants and respected furniture producers. Any ongoing discussions will, of course, be up to the individual designers and manufacturers, but benefit to both is anticipated.

SUBMISSIONS are invited in all categories including chairs, seating systems sofas, tables, desks, work stations, storage systems, lighting, beds, and miscellaneous furniture pieces.

THE JURY FOR THIS COMPETITION
Gae Aulenti, architect, industrial and furniture designer, Milan, Italy.
Thomas H. Beeby, partner, Hammond Beeby and Babka Incorporated, Chicago, architect and furniture designer.
Ralph Caplan, writer, editor, and critic, New York.
Charles Gwathmey, partner, Gwathmey Siegel & Associates, New York, architect and furniture designer.
Richard Schultz, industrial and furniture designer, Barto, Pa.

JUDGING will take place in New York City during the month of February. Designations of *first award, award,* and *citation* may be made by the invited jury, based on overall excellence and advances in the art.

[Turn page for rules and entry forms]

DEADLINE FOR SUBMISSION
JANUARY 17, 1985

Entry form
International Furniture Competition

Please fill out all parts and submit, intact, with each entry (see paragraph 11 of instructions). Use typewriter, please. Copies of this form may be used.

ENTRANT:
ADDRESS:

ENTRANT PHONE NUMBER *(day):*
(evening):

CATEGORY:

ENTRANT:
ADDRESS:

DESIGNER(S) RESPONSIBLE FOR THIS SUBMISSION
(identify individual roles if appropriate):

I confirm that the attached entry meets eligibility requirements (paragraph 1-3) and that stipulations of publication agreement (paragraphs 4-6) will be met. I verify that the submission is entirely the work of those listed on this form (or an attached list as necessary).

SIGNATURE
NAME *(typed)*

FURNITURE COMPETITION
Progressive Architecture
P.O. Box 1361, 600 Summer Street, Stamford, CT 06904

(Receipt)
Your submission has been received and assigned number:

ENTRANT:
ADDRESS:

ENTRANT:
ADDRESS:

ELIGIBILITY

1 Architects, interior designers, industrial designers, and design students from all countries may enter one or more submissions.
2 Design must be original. If found to be substantially identical to any existing product design, entry will receive no recognition.
3 Designer may be under contract to or in negotiation with a manufacturer for this design, but design must not be available in the marketplace as of entry deadline.

PUBLICATION AGREEMENT

4 If the submission should win, the entrant agrees to make available further information, original drawings or model photographs as necessary, for publication in the May 1985 P/A and exhibition at major industry events.
5 P/A retains the rights to first publication of winning designs and exhibition of all entries. Designer retains rights to design.
6 P/A assumes no obligation for designer's rights. Concerned designers are advised to document their work *(date and* authorship) and seek counsel on pertinent copyright and patent

SUBMISSION REQUIREMENTS

7 ***Submissions will not be returned under any circumstances.*** Do not use original drawings or transparencies unless they are sent with the understanding that they will not be returned. P/A will not accept submissions with outstanding custom duties or postal charges.
8 Drawing(s) and/or model photo(s) of the design should be mounted *on one side only* of one 20″x 30″ foamcore board presented horizontally. ***Any entry not following this format will be disqualified.***
9 There are no limits to the number of illustrations mounted on the board, but all must be visible at once (no overlays to fold back). No actual models will be accepted. Only one design per board.
10 Each submission must include a 5″x 7″ index card mounted on the front side of the board with the following information typed on it: intended dimensions of the piece of furniture, color(s), materials, components, brief description of important features, design assumptions, and intentions. This information is to be presented in English.
11 Each submission must be accompanied by an entry form, to be found on this page. Reproductions of this form are acceptable. All sections must be filled out (by typewriter, please). Insert entire form into unsealed envelope taped to the back of the submission board. P/A will seal stub of entry form in envelope before judging.
12 For purposes of jury procedures only, projects are to be assigned by the entrant to a category on the entry form. Please identify each entry as one of the following: Chair, Seating System, Sofa, Table, Desk, Work Station, Storage System, Lighting, Bed. If necessary, the category *"Miscellaneous"* may be designated.
13 Entry fee of $35 must accompany each submission, inserted into unsealed envelope containing entry form (see 11 above). Make check or money order (no cash) payable to *Progressive Architecture.*
14 To maintain anonymity, no identification of the entrant may appear on any part of the submission, except on entry form. Designer should attach list of collaborators to be credited if necessary.
15 Packages can contain more than one entry; total number of boards must be indicated on front of package.
16 Deadline for sending entries is January 17, 1985. First class mail or other prompt methods of delivery are acceptable. Entries must show postmark or other evidence of being en route by midnight, January 17. Hand-delivered entries must be received at street address shown here by 5 p.m., January 17.

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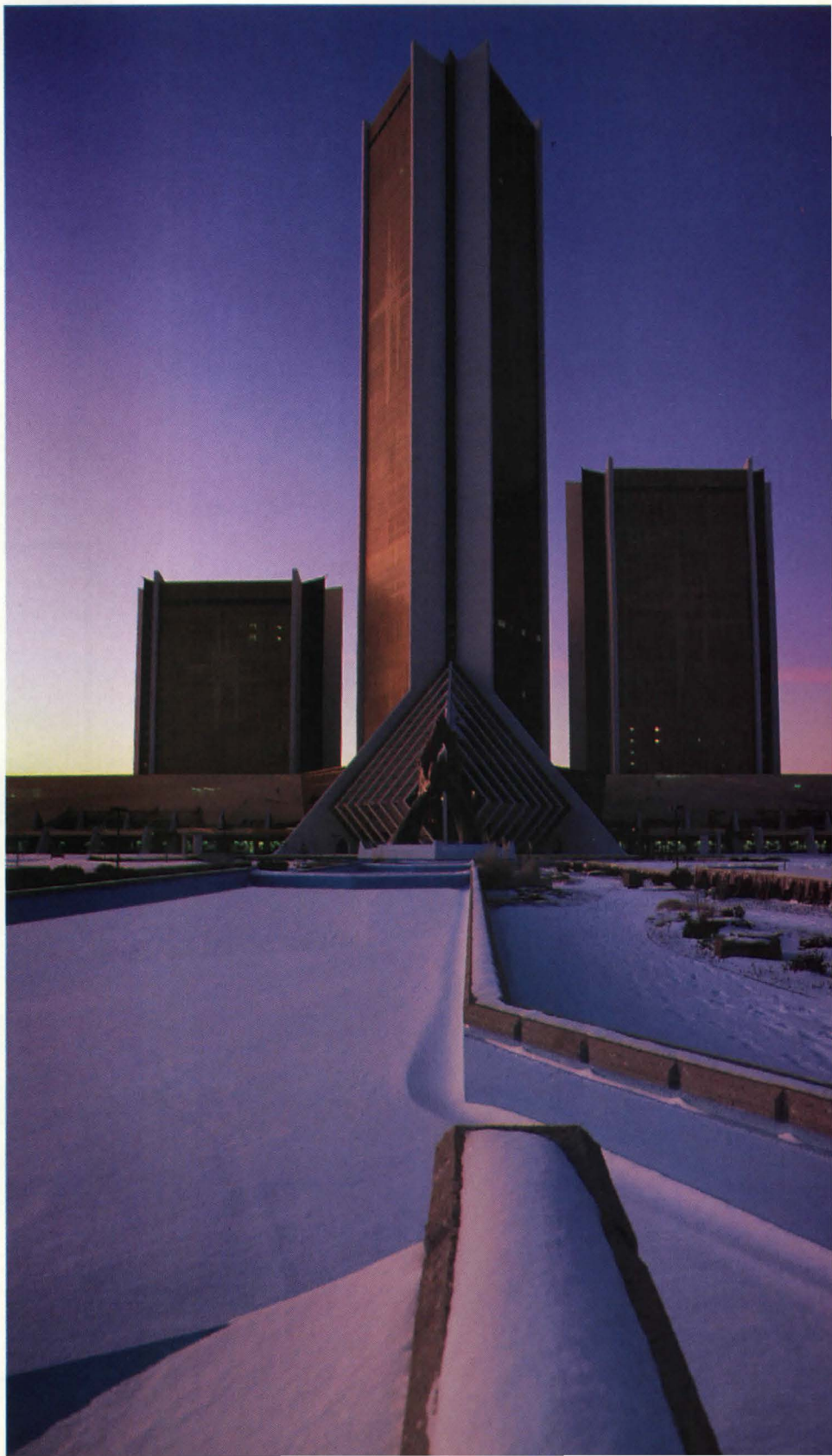

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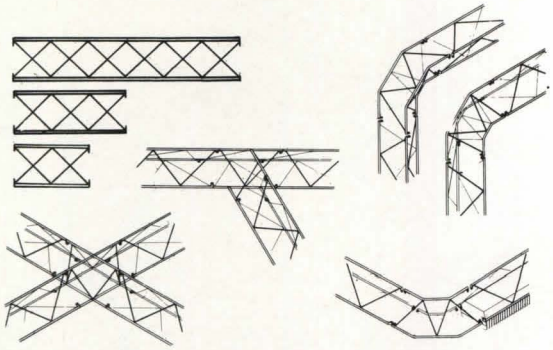

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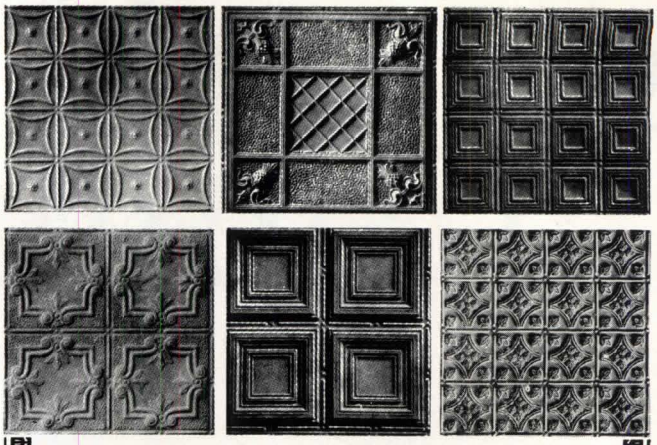

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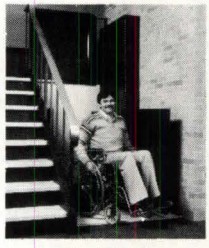

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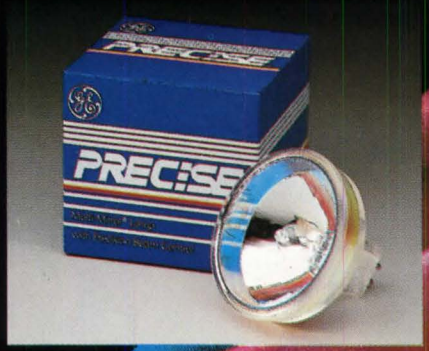

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Books

The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy *by Klaus Herdeg. Cambridge and London, The MIT Press, 1983. 125 pp., illustrated, $22.50. Reviewed by Mary N. Woods.*

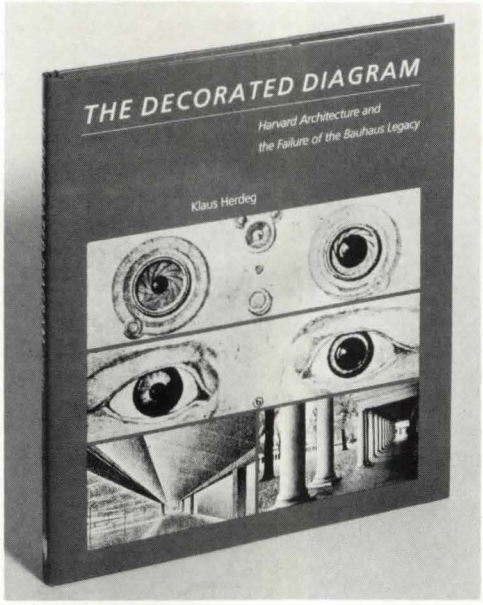
Modernism's decline

Writing in 1866, William Robert Ware observed that while good building was possible without formal instruction, good architecture was not. As head of America's first academic program in architecture—at the Massachusetts Institute of Technology in 1865—Ware was confident that a properly conducted school would put an end to the 19th Century's chaotic eclecticism by creating and disseminating a national style of architecture. In *The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy,* Klaus Herdeg echoes Ware's belief in an educational institution's power to shape stylistic movements, but he is clearly not as sanguine about its effects.

Herdeg attributes the International Style's ascendancy in the United States to Walter Gropius' tenure as chairman of the Harvard Graduate School of Design's architectural program. From 1937 until his retirement in 1952, Gropius, along with his assistant Marcel Breuer, educated *the* cadre of the American Modern movement. The Harvard roster includes such prominent architects as Philip Johnson (B.Arch. 1943), Paul Rudolph (M.Arch. 1947), I.M. Pei (M.Arch. 1946), John M. Johansen (B.Arch. 1942), Edward Larrabee Barnes (M.Arch. 1942), Ulrich Franzen (M.Arch. 1948), and TAC partners John C. Harkness (M.Arch. 1941) and Louis McMillen (B.Arch. 1947). Even before their careers began, these young men were hailed by the press as architecture's best and brightest. Europeans in particular, Herdeg notes, expected much from Gropius' American students. Seen as doubly blessed, they were both free from the Old World burden of history and war and imbued with American optimism and pragmatism. If Modern architecture were ever truly to be an International Style, it would have to take root in postwar America through these architects' works.

Gropius' influence derived not only from his former students' prominence in the profession but also from the cachet of the Harvard name. The HGSD program became the model for other schools' curricula. Even in the midst of Post-Modernism, Herdeg intimates, young architects are still being trained in programs that are HGSD offshoots. Gropius and the Bauhaus are ghosts that continue to haunt the design studio.

Herdeg minces no words on the effects of Gropius' hold on American architectural education. As his title indicates, he contends



that the Bauhaus legacy, as disseminated by Harvard, has been an unmitigated disaster. It has produced architects whose designs glorify only themselves or their clients. Their works, Herdeg maintains, are not so much buildings as attention-getting objects. These structures are at best insensitive and at worst injurious to their physical surroundings and societal context. The plans are diagrammatic, i.e., a simplistic expression of functional relationships, while the façades exist only to stimulate the retina through pattern or texture. What results is a decorated diagram where form is rendered meaningless by its isolation from both function and context. As proof Herdeg adduces a series of comparisons between buildings by the more illustrious Harvard alumni and historical works that fulfill his criteria of architectural coherence and integration. This material accounts for most of the book's length. Among the more devastating comparisons are Johnson's and Franzen's respective façade designs for apartment buildings at 1001 and 800 Fifth Avenue with Le Corbusier's Besnos House, Johnson's Sheldon Memorial Art Gallery with Schinkel's Altes Museum, and Barnes's master plan for the S.U.N.Y. campus at Purchase with Thomas Jefferson's University of Virginia. Never in any doubt, the final score is Harvard zero and History three.

Herdeg possesses a keen eye and an incisive style. He is at his best in these critiques. As a professor of architecture at Columbia University, he is obviously a veteran of many a design jury and quickly gets to the heart of the matter. His evaluation of a design's success or failure hinges on a consideration of its purpose, day-to-day functioning, symbolism, and relation to its surroundings. His use of similes and metaphors is wicked. An account of a viewer's discomfort in the Sheldon Gallery's entry hall, which resembles nothing so much as a giant insect's gaping mouth, or his likening of Johansen's Mummers Theatre to so much Tinker Toy geometry, enlivens the discussion.

Herdeg's diagnosis of Modern architecture's maladies has a didactic purpose. By carefully leading the reader through these discussions, he hopes to instill "a consciously critical attitude toward the past and cultivation of a sensitive attitude toward its interpretation." Presumably he has as little patience with Post-Modernism's often mindless appliqué of historical motifs as with Modernism's barren abstractionism.

It is apparent that for Herdeg Gropius' cardinal sin was his rejection of precedent as a teaching tool in the design process. This led to a literal and superficial formalism where free-floating elements had no iconographic, cultural, or functional purpose. The Gropius student was encouraged to work out original solutions through a seemingly objective and scientific analysis of given facts. Underpinning this approach was Gropius' fundamental misconception, his belief that perception was essentially an objective, quasi-mechanistic process. This fallacy implies four corollaries that color the Harvard architects' attitudes toward design: 1) a pragmatic aesthetic that strips away the metaphorical, symbolic, and formal qualities of an object; 2) a hopelessly romantic neo-primitivism derived from an emphasis on the most rudimentary aesthetic sensibilities; 3) an assumption that forms are merely simple by-products of pragmatic design operations and as such are neutral carriers of meaning; 4) a confusion of the objective and subjective components of the design process resulting in a lack of self-criticism.

The bulk of Herdeg's book is devoted to a discussion of individual buildings rather than to an account of the HGSD curriculum under Gropius. He faults the Harvard architects' designs for the dichotomy between plan and appearance, pointless visual stimulation, an insensitivity to the urban milieu, clumsiness in manipulating space, and ignorance of formal analogies. These criticisms are certainly valid. Yet when the same points are repeatedly scored off each building, the discussion quickly becomes an indictment and

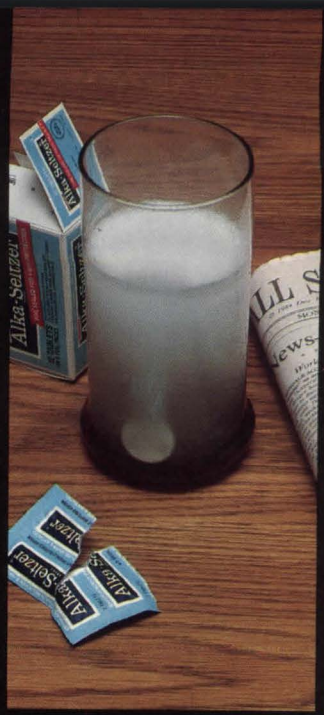
the case studies degenerate into architectural show trials.

At the outset Herdeg asserts that his intention is not to write a minihistory of the Gropius years at Harvard. Nevertheless if he saddles Gropius with sole responsibility for Modern architecture's failure in America, he must prove his case by assessing the Harvard course of instruction. His evidence is skimpy. Herdeg did not interview any of Gropius' former students or teaching assistants. He relies exclusively on published statements, course descriptions, and a dozen problems assigned in the master's class from 1946 until 1951. For an advocate of careful historical analysis and interpretation, Herdeg is curiously lax about utilizing these methods in his own examination of the HGSD program. For example, in a footnote he explains that no illustrations of student work from the HGSD preliminary design course were available for reproduction. Does the reader infer from this that none exist or that the author was unable to locate them or that he was unwilling to track them down? In another passage he refers to the master's class problems of 1946–1951 that survive in the HGSD Archives. The reader again wonders if Herdeg's researches led him no farther afield than Gund Hall. Did he attempt to find others by combing the Gropius Papers at the Archives of American Art or the files and memorabilia still in the hands of former students? Herdeg might dismiss my quarrel with his research methods as a historian's pedantry. After all, he avows that the book is "an educated personal assessment of certain ideas and their manifestations." Yet surely before indicting Gropius and the HGSD, a thorough and complete understanding of both the professor and his program is necessary.

Herdeg has performed an important service by calling our attention to the central role an architectural school can play in legitimizing and disseminating a new style. But just as he rejects a univalent approach to architectural form, I cannot accept a monomaniacal view of architectural history where Gropius and Gropius alone is held accountable for Modern architecture's failures. Economic and technological considerations were also relevant to postwar America's acceptance of Modernism. Their Harvard education certainly molded the architects Herdeg discusses; however, these men did not design and build in a vacuum. They responded to the demands and suggestions of clients, financiers, engineers, construction specialists, and critics. Herdeg even acknowledges at one point that the Harvard architects did not always blindly follow the Harvard/Gropius party line. They all, with the exception of the TAC partners, rejected the idea of teamwork and embraced the ideal of architecture as art rather than science. Since they considered themselves artists, their works must also be seen against the backdrop of abstractionism in painting and sculpture of the period. In this respect, it is rather ironic that Herdeg began writing his book as a result of Clement Greenberg's innocent query concerning why there were so many ugly buildings. Surely the very paintings that Greenberg championed during the late 1950s and 1960s share with the Harvard architects' buildings a lack of scale, emphasis on retinal stimulation, and rejection of historical prototypes.

Herdeg has convincingly argued that architects avoid precedent at their own and society's peril. Just as the architectural profession has finally come to terms with the historical models Gropius rejected out of hand, it must also learn to deal with its past as represented by his years at Harvard. ■

MARY N. WOODS *is assistant professor of architectural history at Cornell University.*



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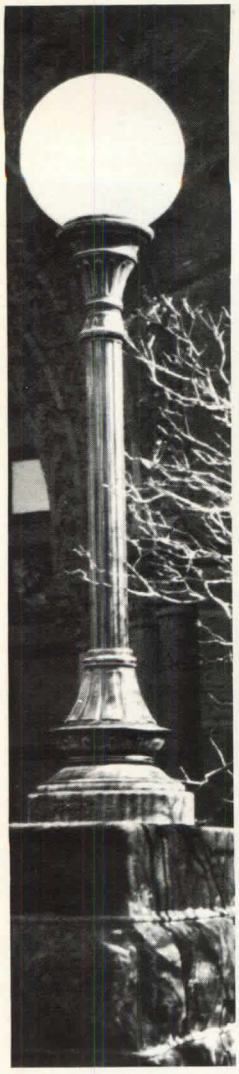

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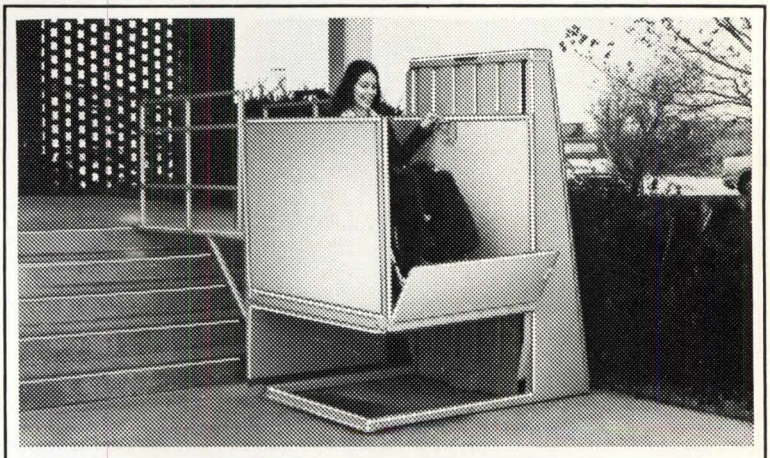

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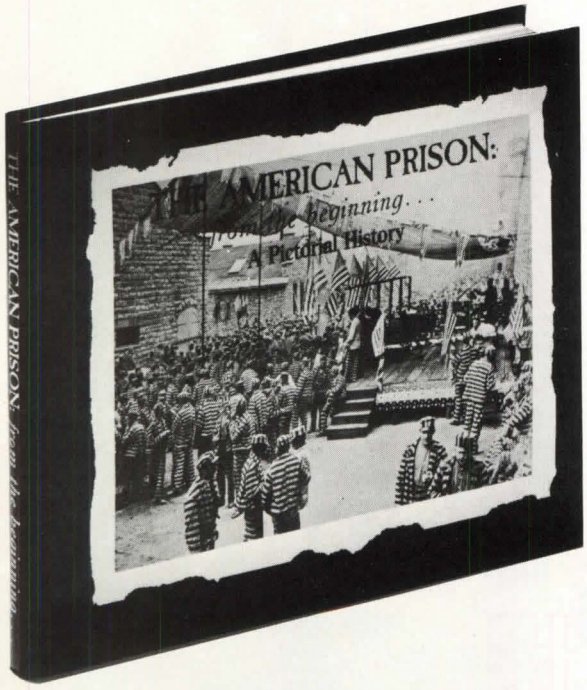

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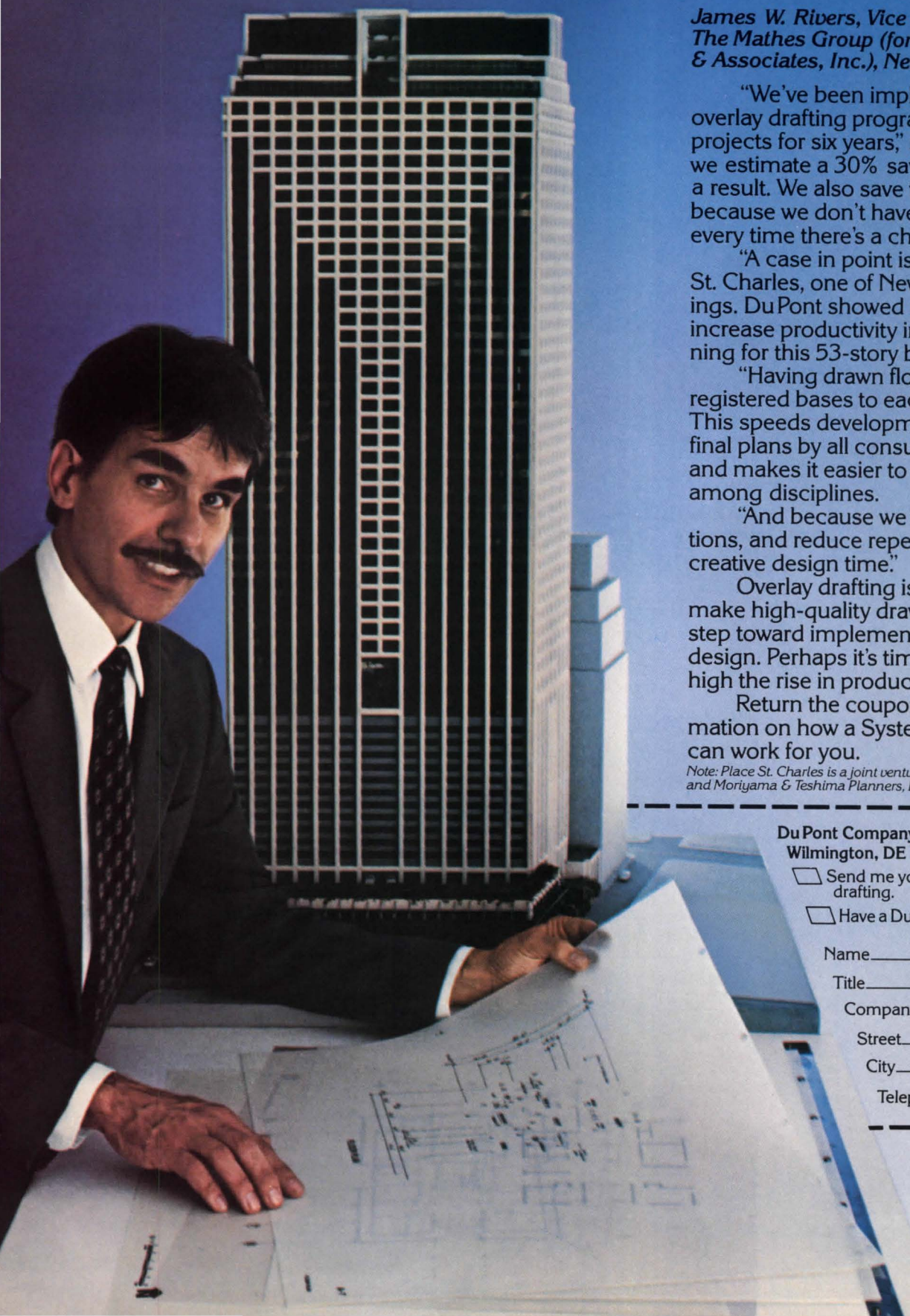

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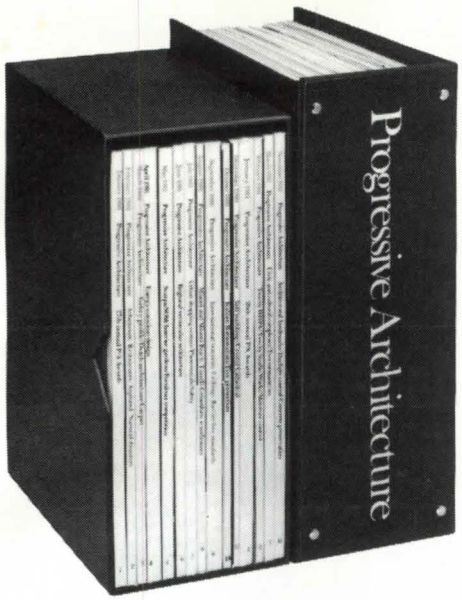

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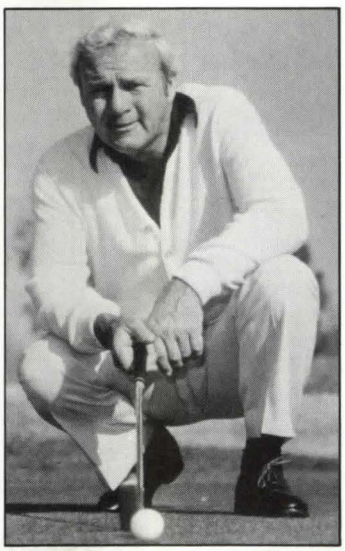

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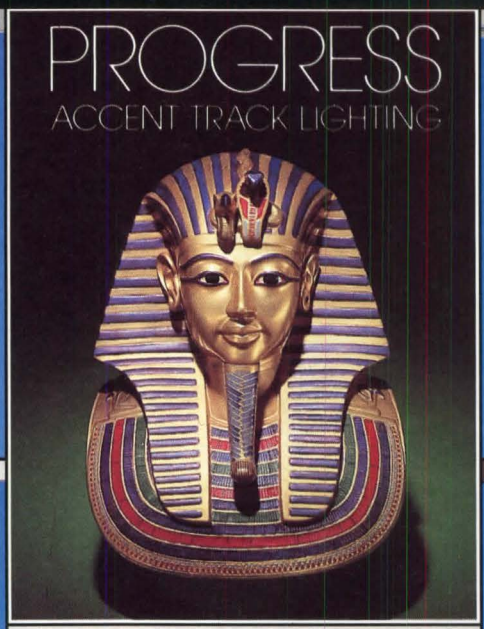

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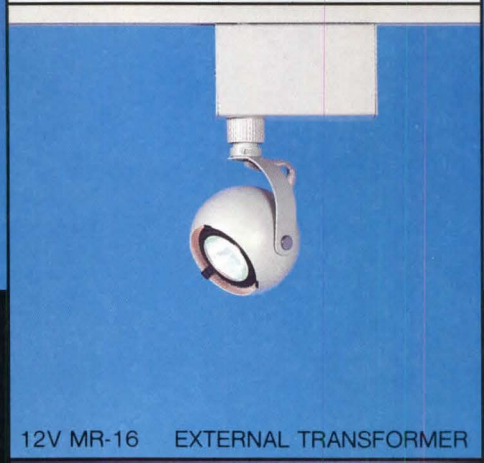

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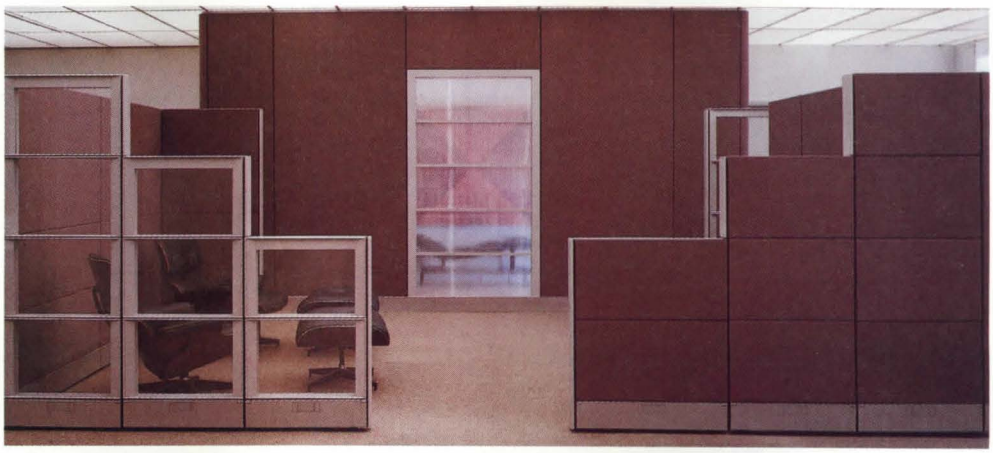
A new view of the open office landscape, and the latest in paint products related to this month's Technics article (p. 131), lead off the product report on the following pages.

The open office: Search for civility

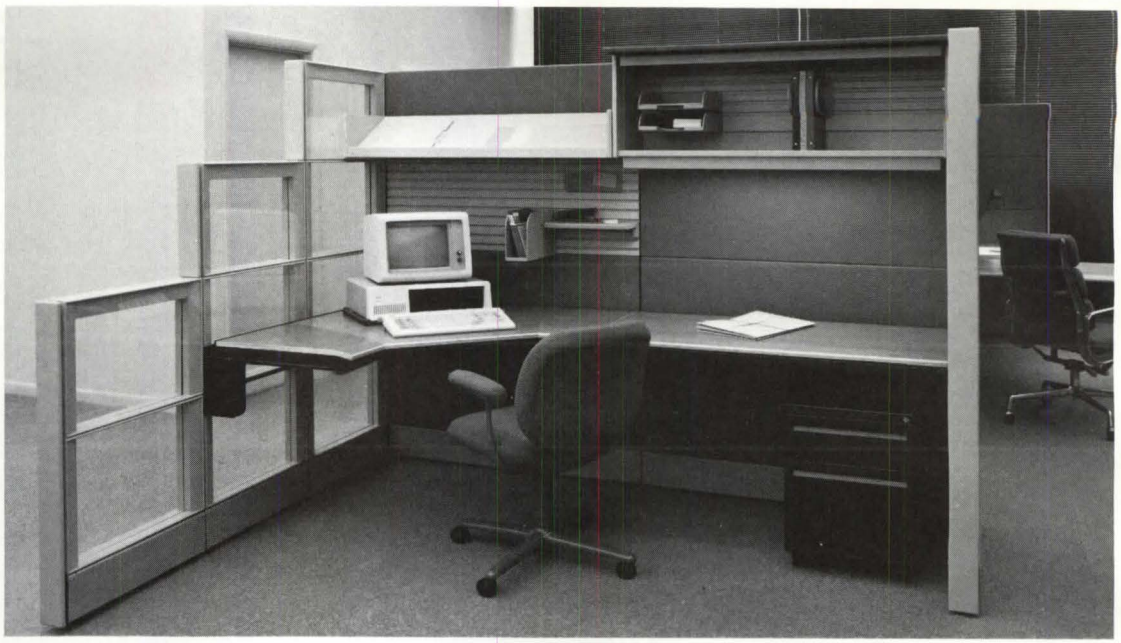
When it comes to technology and ergonomics, designer Bill Stumpf feels that today's open office has everything—except civility, that mixture of utility and graciousness that makes an office *livable* as well as efficient. Herman Miller's Ethospace™ system, designed by Stumpf in collaboration with Jack Kelley and Clino Trini Castelli, was conceived to avoid the classic "trade-offs" of open-office systems, by offering variety and a sense of place without sacrificing the flexibility of a stock component system. Stumpf's have-your-cake-and-eat-it-too solution is a steel structural frame that houses all necessary wiring and supports horizontal panels, called tiles, that can be finished and arranged in almost any manner. Variations in frame heights and combinations of glazed and solid tiles afford privacy *and* open space while offering welcome vistas within the office landscape, and access to daylight. Since Ethospace's structure and "skin" are separate, tile changes are painless, and since the tiles attach to both sides of the frame, workstation interiors can be personalized without disrupting the unity of the overall office design. To this refreshingly simple structure, Stumpf adds complexity where it belongs: "through details," such as the shoji-screen-like proliferation of "seam" lines that eliminate the monolithic look of so many system panels, the sophisticated accessory line, and thoughtfully detailed joints and surfaces. This is good industrial design; it is also good architecture. **[PV]** ■

Circle 100 on reader service card



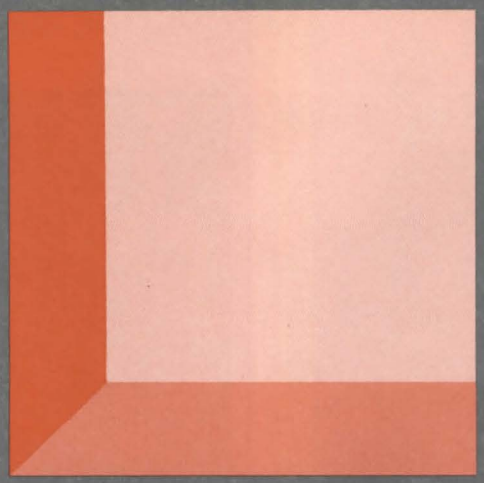
The picture that's worth a thousand words (top): Ethospace's steel structural frame, a "beefy" 4 inches thick, is available in three heights (38 inches for easy communication, 54 inches for sitting privacy, and 70 inches for standing privacy). It supports a "skin" of modular, horizontal "tiles," of glazed, fabric-covered or wood-veneered panels that can be arranged to suit both the overall office design and the individual worker's environment (above). Rail Tiles have horizontal frets to support shelves and other organizers; the Personal Light is part of an elegant accessory line.

Glazed tiles (right) can be either transparent or translucent, offering access to natural light, visual contact with other workers, and relief from close-up tasks such as working at a CRT. Rail Tiles support shelves, paper trays, and other accessories both at worksurface height and in the overhead storage compartments. Acoustical panels can be placed selectively for maximum efficacy.



A trough that runs behind the worksurface holds all necessary wiring for task lighting and electronic equipment (above), and computer support surfaces are available with optional electric motor drive. Tackboard and markerboard panels offer other "infill" options for the structural frame. Details, such as the waterfall edges of tables and worksurfaces, and the sleek task and table lights, were designed to give the system a consistently high level of "creature comfort" elegance at all levels of the office hierarchy.

[Products continued on page 164]



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ANNOUNCES
THE SECOND ANNUAL WALL SURFACE COMPETITION

PLACES II

Columbus Coated Fabrics, producers of Guard® contract vinyl wallcoverings, announces The Second Annual Architectural Competition, PLACES II. Last year, Columbus Coated Fabrics inaugurated an unusual design competition for students and young architects.

The competition centered on a design problem set by a panel of distinguished architects who later juried the results. They were: Peter Chermayeff, Robert A.M. Stern, Stanley Tigerman, with Charles Gwathmey participating in the composition of the problem, and James A. Murphy of PROGRESSIVE ARCHITCTURE as moderator. They gave the competition its name, PLACES, and set a standard designed to draw out the best in imagination and skill.

This year, the PLACES competition continues. Philosophically, it is the same, but in other respects it is totally new—in its theme, its presentation, its prize structure, and, of course, its panel of architects.

THE PANEL:

Thomas Beeby, Hammond Beeby & Babka, Inc., Chicago
Charles Gwathmey, Gwathmey, Siegel & Associates, New York
Robert H. Timme, Taft Architects, Houston
Susana Torre, The Architectural Studio and Columbia University, New York
William Turnbull, MLTW/Turnbull Associates, San Francisco
James A. Murphy, Profession & Industry Editor, Progressive Architecture (Moderator)

THE PROBLEM

A Wall of a Room in a Tower
You are invited to design a wall of a room in a tower, within a virtual volume that is 10' wide x 16' high x 4'6" deep.

The project is to be submitted as a model in 1½" scale, i.e., 15" x 24" x 6¾.

Four groups of Guard® wallcoverings will be available for the project. Included are three patterns just introduced: "Cerritos," a 12-ounce vinyl with a tiny diamond-weave embossing, in 30 colors; "Montego Bay," 15-ounces with a clean-cut, raised pin-stripe and a slightly glossy surface, in 30 colors; and "San Moritz," 24-ounces with a geometric dot and a textile-like surface, in 40 colors. The fourth group is the classic "Stipple," 24-ounces, lightly textured, and available in 80 colors.

PRIZES, AWARDS & RECOGNITION

There will be three prizes in each division, Student and Professional, as follows:

First Prize:	$2,500
Second Prize:	1,500
Third Prize:	1,000

Note: For team projects, prizes will be shared among team members. Honorable mentions will be awarded at the discretion of the jury. All winners and honorable mentions will receive the PLACES award, an engraved lucite plaque. Winners and other projects will be exhibited in Chicago during Neocon 1985. They may also be exhibited in New York and elsewhere at the discretion of the sponsor.

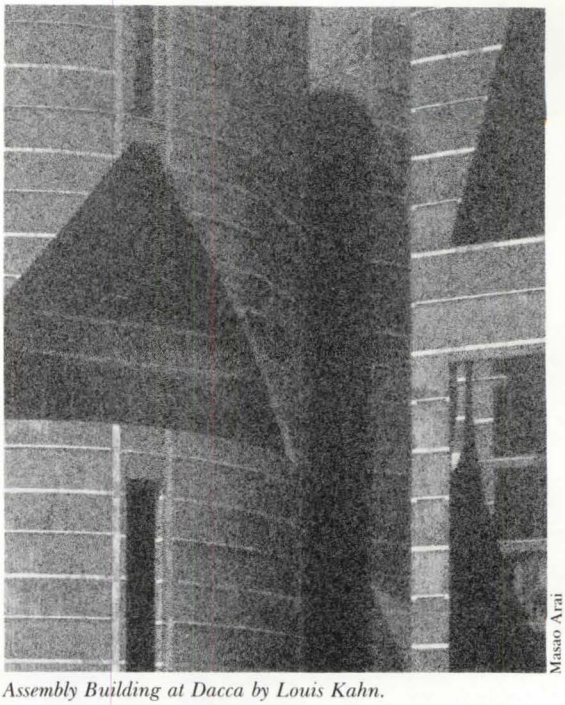
TIMETABLE:

Entry requests will be filled from November 1, 1984 to February 1, 1985. Deadline for submissions is March 4, 1985.
Judging: March 28, 1985
Awards Presentation: June 11, 1985.

INFORMATION:

For full details, please contact
CCF Design Competition
Columbus Coated Fabrics
P.O. Box 208
1280 N. Grant Ave.
Columbus, Ohio 43216
Attn: Sally Greene

P/A in December: Legacy of Kahn



Assembly Building at Dacca by Louis Kahn.

The Legacy of Louis Kahn will be the subject of P/A's December architectural design features. This year marks the tenth anniversary of Kahn's death and—it happens—the completion of his National Assembly Building at Dacca in Bangladesh. This special issue will include generous visual coverage and a critical assessment of the Dacca landmark and a reexamination of a pivotal early work, the modest Trenton bathhouses, built in New Jersey in 1955.

The work of Kahn's students and followers will be represented by articles on three subjects: new buildings by Philadelphia architects Brigette and John Christopher Knowles; a survey of Kahn's influence on contemporary Japanese architecture; a pair of houses by the widely admired Swiss architect Mario Botta, who acknowledges a substantial debt to Kahn.

Technics: Metal Cladding and Metal Roofing will be the topic of an article on basic principles and new developments. Various systems will be differentiated on the basis of cost and performance. Attention will be called to fine points of finish coatings, fasteners, and installation.

P/A in January: The 32nd P/A Awards competition will be the subject of this annual special issue. The choices of eight distinguished professional jurors will be amply documented and accompanied by their enlightening commentary.

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P/A products and literature

Fluoroelastomer coatings can be used in the building industry to protect plastic, metal, concrete, and entire structures from corrosive agents. The two-part system can be made conductive to stop electromagnetic interference (EMI) and radio frequency interference (RFI). The coatings form a tight, chemical bond to substrate material and can be covered with chemically compatible paints. Lauren Manufacturing Co.
Circle 102 on reader service card

A-100 flat white latex paint for exterior use is a bright white that has high hiding qualities. It is easily applied and resists chalking, fading, and mildew. It provides a durable finish and is suitable for new construction and repainting. Sherwin-Williams Stores Division.
Circle 103 on reader service card

Aquatrol™ clear finish for exterior wood is a high-solids penetrating finish that protects wood against the effects of moisture and sun. It resists mildew, does not crack or peel, and requires only soap and water for clean-up. The finish can be applied with brush, roller, or airless spray. It can be used on vertical exterior wood surfaces such as cedar shingles, cedar and redwood siding, fences, and exterior textured plywood paneling. The Flood Company.
Circle 104 on reader service card

Geotone masonry stain, a blend of 100 percent acrylic resins and inorganic pigments, penetrates masonry to color it and provide water repellancy. It can be applied to old or new concrete and offers consistent, stable color. It is resistant to ultraviolet light, acid rain, alkalis, pollution, and rain. It comes in eight standard colors and can be custom color matched. Qesco Corp.
Circle 105 on reader service card

CrystalSEAL concrete treatment, spray-applied to concrete, brick, and masonry, cures, hardens, seals, waterproofs, acidproofs, dustproofs, and oilproofs the surface. The nontoxic material penetrates and dries without surface film so that paints and other coatings will bond. Cordyne Industrial Corp.
Circle 106 on reader service card

Tneme-Tufcoat water-based acrylic-epoxy coating has low odor and fast-drying characteristics. It has a smooth, hard finish for durability, resistance to soil, and easy cleaning. It adheres to a variety of existing coatings and is self-priming. Application is by spray, brush, or roller. Tnemec Company, Inc.
Circle 107 on reader service card

Spred® exterior paints for houses and trim are available in gloss, semigloss, and flat finishes in white and colors. Glidden also offers masonry paint, solid color and semitransparent oil stains, latex stains, and metal-protecting enamels. Glidden Coatings and Resins, Div. of SCM Corporation.
Circle 108 on reader service card

Exterior wood finish with high solids content has an EPA-approved wood preservative. It applies quickly and easily and prevents fungal *rot and decay*. Watco-Dennis Corp.
Circle 109 on reader service card

Oil-based wood stain for exterior use protects against mildew and fading caused by ultraviolet rays. The semitransparent stain repels water, making it suitable for wood decks, porches, and similar areas that are exposed to the weather. It can be applied to bare wood or previously stained wood. Finnaren & Haley, Inc.
Circle 110 on reader service card

Acrylic Texture Coating for application over exterior and interior surfaces is available in fine and coarse blemish-hiding finishes. It can be applied to masonry, metal, and plywood with roller or spray. The coating resists moisture penetration while allowing surface moisture to escape. Elastic properties prevent blistering and peeling. Texture Coating is available in 16 colors as well as custom colors. Chemrex Coatings Company.
Circle 111 on reader service card

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Sal F. Marino, President, Penton/IPC, Inc.

Urethane coatings for metal buildings are of two basic types. The one-component coating cures through reaction with atmospheric moisture and is often used as a primer to combat corrosion. The two-component coating consists of one part containing solvents, pigments, fillers, additives, and polyol resins and one part hardener. It is generally used as a finish coat, which offers color and gloss retention, chemical, abrasion, and impact resistance, weatherability, and corrosion protection. Mobay supplies urethane components to paint manufacturers. Mobay Chemical Corp.
Circle 112 on reader service card

Penofin® penetrating oil finish seals wood and dries quickly. It has a microporous finish that allows moisture to enter and exit only as vapor to prevent rapid expansion and contraction of the wood. It also seals nails to prevent them from bleeding. The transparent finish, which combines Brazilian Rosewood oil, pigments, and a mildewcide, filters most of the sun's ultraviolet rays. Performance Coatings, Inc.
Circle 113 on reader service card

Wonder-Shield® exterior acrylic latex house paint can be used on new or previously painted exterior wood siding; doors and trim; weathered aluminum and vinyl siding; primed metal and masonry. Flat finish can also be used on shakes, shingles, and weathered asbestos siding. It is available in flat or satin finishes in ready-mixed and custom colors. It resists fading, blistering, peeling, and mildew. Application is by brush, roller or spray. Devoe & Raynolds Co.
Circle 114 on reader service card

Versaflex heavy-duty gloss enamel can be used for exterior or interior wood, brick, cement, and plaster. The finish resists oil, grease, rust, and mildew and is easy to clean. It is available in more than 1000 colors in both latex and alkyd qualities. Fuller-O'Brien Paints, The O'Brien Company.
Circle 115 on reader service card

Water-based waterproofing sealers for masonry and concrete keep surfaces clean and new looking. W-1 is a five percent solids sealer for ordinary concrete and masonry surfaces. W-2 is a ten percent solids sealer for concrete block and other porous materials. They are compatible with latex paints and stains, caulks and sealants, and are easy to apply and clean up. Okon, Inc.
Circle 116 on reader service card

MoorGard® and MoorGlo® paints for exterior use are blister, alkali, mildew, and fume resistant. MoorGard is low-luster vinyl acrylic latex for siding, trim, shakes and shingles, masonry, and primed metal. MoorGlo, a soft-gloss acrylic latex, is house and trim paint and is especially recommended by the manufacturer for aluminum siding. Both are available in several colors shown in a six-page folder. Benjamin Moore.
Circle 200 on reader service card

Dymacryl™ waterproof masonry stains, described in Bulletin 1100, combine 100 percent acrylic polymers and copolymers, color-stable pigments, and surface penetrants. They are resistant to weather and chemicals and do not fade or discolor. The stains, available in ten colors, will protect above-grade surfaces of architectural concrete, poured and precast concrete, brick, stucco, natural stone, unglazed tile, and terra cotta. Dampney Company, Inc.
Circle 201 on reader service card

Paints & Stains, a 64-page technical data catalog, provides data sheets for a variety of interior and exterior paints and stains, waterproofing products, and wood preservatives. Each sheet includes product description, restrictions on its use, composition and compliance with regulations, colors, chemical data, and availability. Specifications include surface preparation, application information, and precautions to be observed. Samuel Cabot, Inc.
Circle 202 on reader service card

Acrylic polyurethane coating, developed specifically for signs, retains color and gloss, and resists weather and harsh industrial atmospheres. Most graffiti can be removed with a cloth moistened in the appropriate solvent, without harming the surface. The coating is described in a four-page brochure that includes performance characteristics and specifications. Matthews Paint Company.
Circle 203 on reader service card

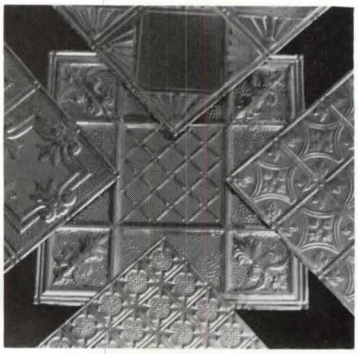
Door hardware in 18th Century style is described and illustrated in an eight-page brochure. Brass handles, knobs, and locksets for interior and exterior doors and forged iron interior latches are included. Baldwin Hardware Manufacturing Corp.
Circle 204 on reader service card

Sure Klean Efflorescence Control System consists of a water-soluble cleaner that removes efflorescence salts and cleans masonry surfaces and a preventive treatment that penetrates the masonry to halt salt formation. It dries clear and will not etch or discolor the surface. ProSoCo, Inc.
Circle 117 on reader service card

Design-Cast® 66 is used for field or studio restoration of brick, stone, and terra cotta ornament and sculpture. It remains workable for two to four hours after mixing and hardens in 24 hours. Addition of stones, sand, or crushed marble provides stonelike textures. It is sunlight and freeze-thaw stable and bonds to brick, terra cotta, or masonry. Design-Cast Corp.
Circle 118 on reader service card

Conservare® pigeon control mesh netting restricts roosting areas. It is made from ultraviolet-stable plastic that resists damage from weathering and sunlight. The netting installs with stainless steel pins and is virtually invisible in place. Colors are gray, beige, and red-brown. ProSoCo, Inc.
Circle 119 on reader service card

Asbestos control brochure discusses encapsulation as a cost-effective solution to asbestos control. Methods include Foster® bridging encapsulant for use over hard, painted, or nonabsorptive insulation surfaces, and Protektor® sealant for porous insulation. H.B. Fuller Company.
Circle 205 on reader service card



Pressed tin ceilings stamped from original dies dating to the 1890s are available in 2′ x 8′sheets. Also available are cornice moldings to finish the area between the wall and ceiling, which range in width from 2 to 9½ inches. Chelsea Decorative Metal Company.
Circle 120 on reader service card

Concrete protection, repair, and restoration materials consist of more than 40 items. There are products that insulate, provide a decorative/protective coating, or repair damaged finishes. A four-color booklet discusses the products and illustrates specific projects. Thoro System Products.
Circle 206 on reader service card

Building materials

Major materials suppliers for Guaranty Building featured this month as they were furnished to P/A by the architects.

Guaranty Building, Buffalo, N.Y. (p. 88). *Restoration architects: Cannon, Buffalo.* Steel frame infill: Bethlehem. Aluminum framed windows: Kawneer. Mahogany windows and doors: Quality Lumber. Concrete sidewalk with glass block: Circle Redmont. Granite and marble floors: New England Stone Industries; Tiede Zoeller. Ceiling systems: Donn Products Fine Line/ U.S. Gypsum Tile. Waterproofing: Sarnafil. Rigid insulation: Celotex; Styrofoam SM by Dow. Paints and stains: Cabot; Sherwin Williams; Fuller O'Brien; Pittsburgh. Hardware: Sargent; Stanley; Frontier Plating. Smoke detection: Simplex. Recast lanterns: Robinson Iron. Refurbished lamps: Wilmer & Snow. 2x2 parabolic building standard lamp: Keene. Electrical distribution: Square "D" Manufacturing. Heating system: Trane. Blinds: Levolor, Riviera.

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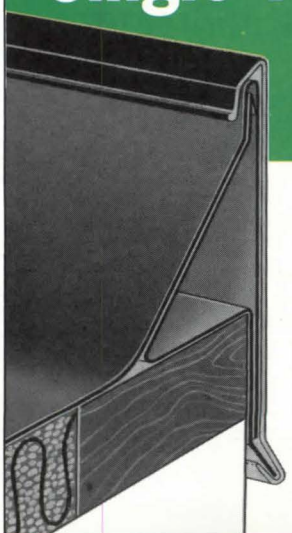

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The Architectural Technology Department of NYC Technical College/CUNY is accepting applications for the position of Assistant Professor. Qualifications include appropriate Master's degree, professional registration (R.A.) and a minimum of 5 years of experience in the industry. Knowledge of computer assisted design drafting (CADD) is desirable. Submit letter of application and curriculum vita to:
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Architectural Illustrator—Premier Cincinnati firm is presently seeking talented illustrators to produce architectural renderings. Previous experience in field is required. Send photos and resume to View Point, Inc., 6801 Miami Avenue, Cincinnati, Ohio 45243.

Architectural Specifications Writer—The Architects Collaborative, a multi-disciplined architectural design firm with an international clientele, requires an experienced specification writer. Applicants should have a bachelors degree in architecture and a minimum of six to eight years experience in development of project manuals for major architectural projects. The position requires a thorough understanding of CSI format and familiarity with various bidding and contract formats. Please send resume with salary requirements to: Mary Hale, Personnel Manager, The Architects Collaborative, Inc., 46 Brattle Street, Cambridge, MA 02138. An Equal Opportunity Employer.

Design Architects—HLM is a top 20 national A/E firm seeking experienced Senior Design Architects, for our Iowa office. Position requires a Bachelor's degree and experience in medium to large-scale institutional, commercial or industrial projects. Health care project experience is a plus. Design Architects should have a minimum of 5 years related experience in all aspects of architectural design. Candidates must be capable of making client presentations and have the ability to work with top level clients and executives. If quality of life and professional growth is important to you, look into our dynamic, growth-oriented firm, located in an ultra-professional Big 10 university community known for its cultural environment. We offer outstanding professional opportunities, competitive salaries and attractive benefits. Send letter and resume in confidence to: Director of Personnel, Hansen Lind Meyer, Drawer 310, Plaza Centre 1, Iowa City, Iowa 52244. EOE M/F

Faculty Position Openings—The Department of Architecture at the University of Oregon is seeking applicants for three possible fixed term faculty positions to begin in the Fall of 1985. One will be in the Interior Architecture area and two in the Architecture program. Applicants should have professional experience and Masters degree in the appropriate field. Applications are due 15 February, 1985. All requests for information should be addressed to Mary Christoferson, Adm. Asst., Department of Architecture, University of Oregon, Eugene, OR 97403. The UO is an EEO/AA employer.

Positions immediately available in 16 person design oriented, San Antonio architecture & interior design firm. Architectural Specification Writer—technically proficient individual, experienced in MasterSpec system. Act as in-house technical consultant during design production, submittal processing and construction phases. Interior Designer—architectural design oriented individual with degree in Architecture or Interior Design, 3 to 5 years experience in architectural interiors and contract design. Send resume and/or portfolio to: Chumney/Urrutia, 1023 Avenue B., San Antonio, Texas 78215.

Project Architect in design-build firm. Fully responsible for architectural programming, design, and drafting team for ½ to 10+ million dollar projects as well as client contact. Experience should be with duties above and a full working knowledge of building codes and regulatory requirements. Registration and/or Advanced Degree is preferred and promoted. Salary is competitive with industry, dependent upon experience and performance. John Rogers, P.O. Box 117, Worcester, MA 01613.

Signage/Environmental Graphics Designer—Top 20 National A/E firm is seeking an Architectural Signage/Environmental Graphics Designer with a minimum of 2–3 years experience for its

Iowa City, IA office. Candidates must possess knowledge of traffic circulation, the design/production process, and have creative design abilities. Must be capable of dealing with clients and making presentations. Minimum of bachelor's degree in architecture, graphics design, interior design or commercial art preferred. Will be the Director of Signage for Iowa City office. If quality of life is important to you, look into our dynamic, growth-oriented firm, located in an ultra-professional Big 10 university community known for its cultural environment. We offer an outstanding opportunity, professional growth, competitive salary and attractive benefits. Send resume in confidence to: Director of Personnel, Hansen Lind Meyer, Drawer 310, Plaza Centre One, Iowa City, IA 52244. EOE.

Urban Design Consultant—As architects and engineers we design complexes within urban areas which include all types of facilities from rental and condominium residential units to commercial establishments and industrial complexes, with supporting facilities and proper land use through creative landscaping. Applicant will analyze the impact of these facilities on local resources such as water and electricity, and the effect on population density in the development of our plan integrating the architectural design. Applicant must have training as an architect with an advanced degree in Urban Design. M.S. Urban Design with undergraduate training in architecture. 37.5 hours per week. 8:45–5:15. $10.00 per hour. Send resumes to Illinois Job Service, 910 South Michigan Avenue, Third Floor, Chicago, Illinois 60605. Attention: Joan Sykstus, Reference #3755-T, An Employer Paid Ad.

Situations Wanted

Architect—Registered Architect, Professional Engineer, ten years experience with variety of architectural projects, computer operations and business management. Seeking management position with architecture or A/E firm. Resume available. Reply to Box 1361-441, *Progressive Architecture.*

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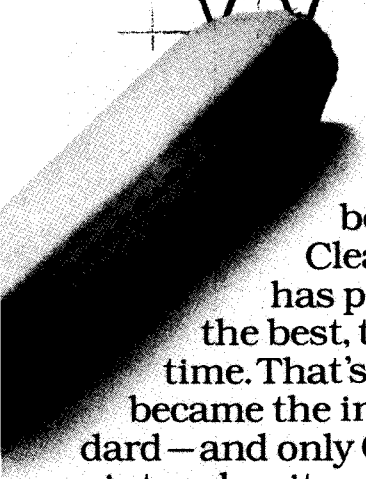

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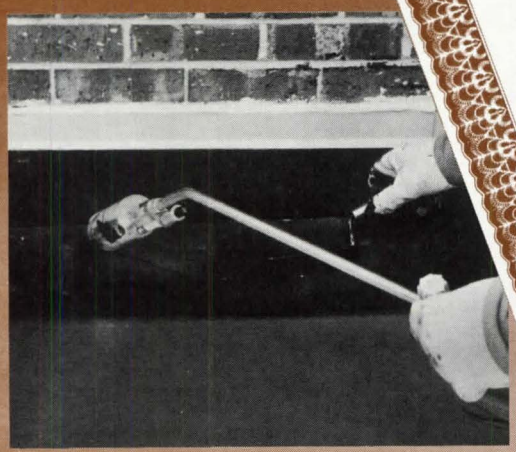

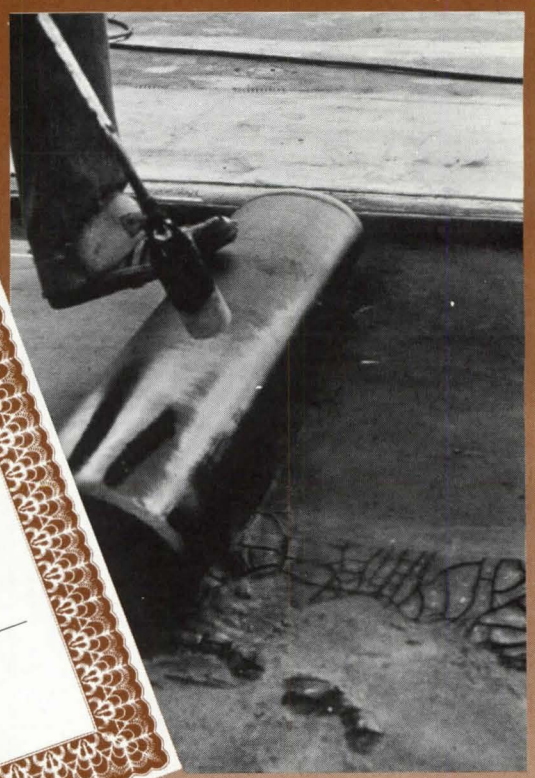

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